WIRE AND WIRE PRODUCTS

APRIL 1954

with

VAUGHN® Motoblox

you enjoy

NO STORAGE
NO ACCUMULATION
NO TWIST

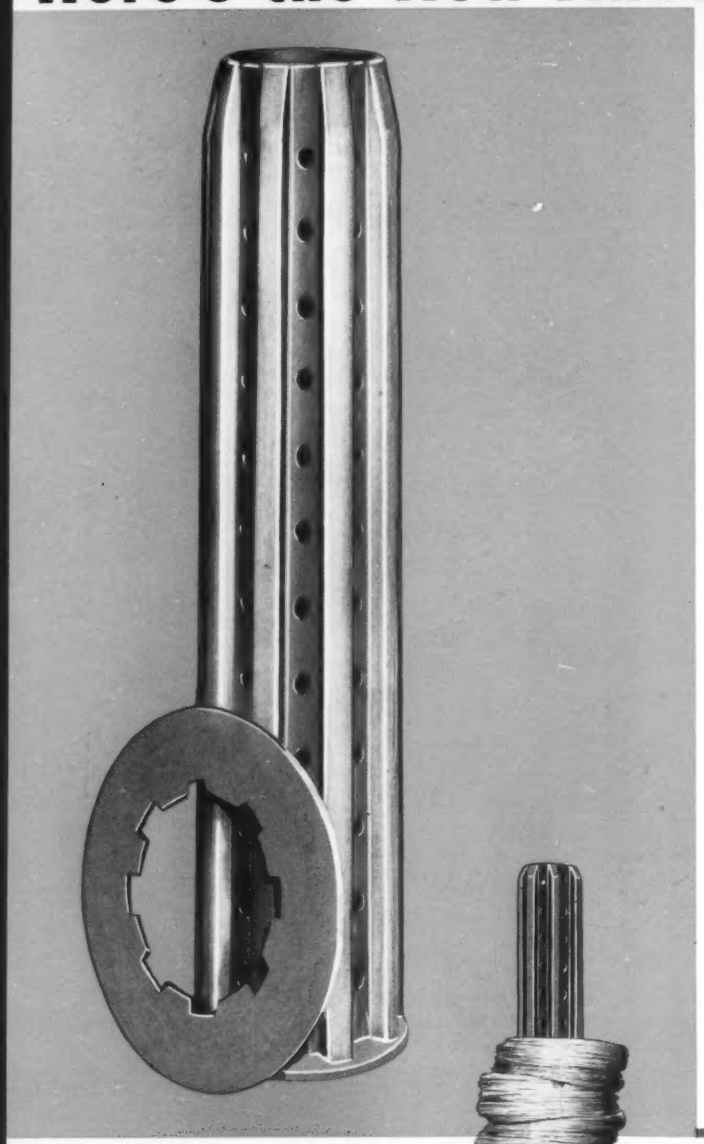
Always

SIMPLE, AUTOMATIC
LOW COST OPERATION

THE VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO, U. S. A.
COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

Here's the New Annealing Furnace Spider that Speeds Rod and Wire Coil Handling

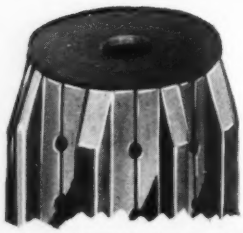


The new Lee Wilson MULTI-UNIT Furnace Spider that simplifies rod and wire coil handling, assures better annealed product and reduces snagging and wire scrap, begins as a single stave. This stave is so designed that a number of them can be mated into a circle of any diameter. Thus, whatever diameter spider is required can quickly be assembled from stock staves.

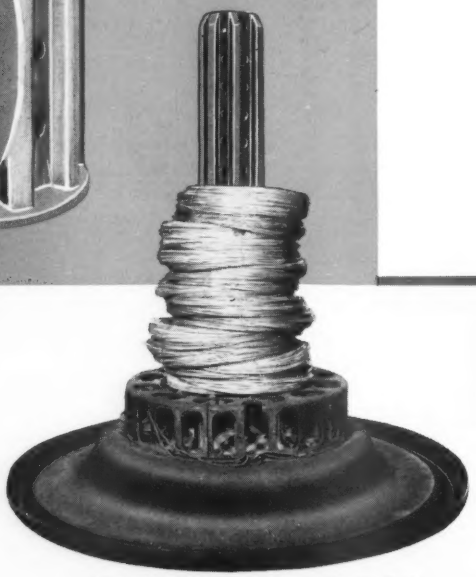
The design eliminates rough edges, permits better circulation of heat, is lighter but stronger and is engineered to work in conjunction with latest handling methods and devices.

For replacement spiders, and/or new spider equipment, make sure you are acquainted with the new Multi-Unit Spider, engineered by Lee Wilson Engineering Co., Inc., the nation's most experienced producer of wire annealing equipment.

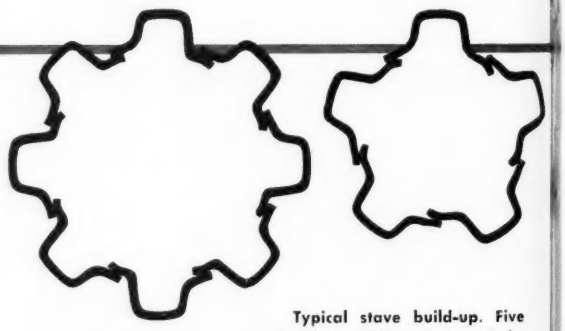
Stave edges are fully rounded — thus wire snagging is eliminated. Loading and stripping time can be decreased without hazard to coil strands.



Wire coils easily slip over beveled stave edges. Welded disc top provides extra strength, adaptable to modern safety lifting tongs.



New spider design permits maximum heat circulation resulting in more uniform anneal, in the shortest possible time.



Typical stave build-up. Five units form 10" diameter circle. Eight units form circle of 15" diameter.

Lee Wilson MULTI-UNIT FURNACE SPIDERS

Lee Wilson ENGINEERING COMPANY, INC.

20005 WEST LAKE ROAD

CLEVELAND 16, OHIO

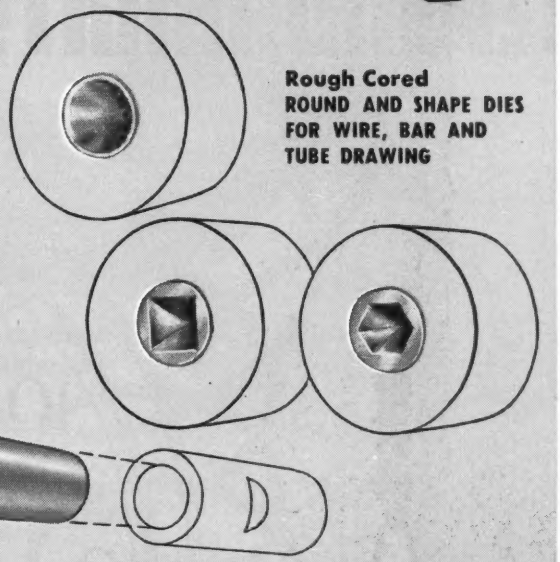
NEW BOOKLET AVAILABLE UPON REQUEST

Specify Firthaloy

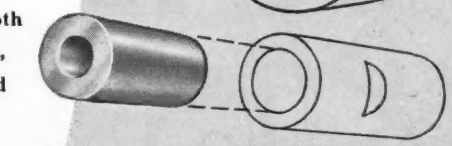
FIRTHALOY Sintered Carbide is the standard of quality for drawing and forming operations. It assures maximum production, uniform size, excellent finish and economical operation. To do work better, faster, and cheaper . . . specify FIRTHALOY Sintered Carbide when ordering from your local tool and die maker.

Firth Sterling supplies standard wire, tube and bar dies in a rough cored condition in sizes up to R7. Dies R7 and larger are available both rough cored and rough drilled. In addition, FIRTHALOY Sintered Carbide is furnished in a wide variety of shapes and sizes . . . . another reason why leading tool and die makers have adopted Firth Sterling as a preferred source.

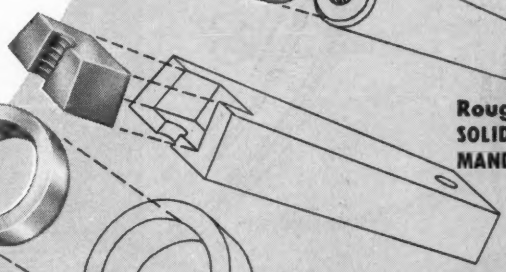
When you specify FIRTHALOY, you are assured of close co-operation between your tool and die maker and experienced Firth Sterling Service Engineers . . . "teamwork" that adds up to maximum performance and increased production.



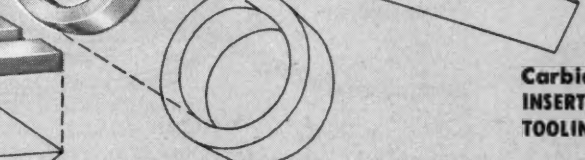
Rough Cored
ROUND AND SHAPE DIES FOR WIRE, BAR AND TUBE DRAWING



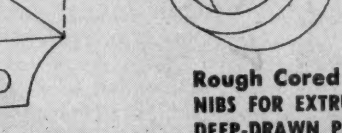
Rough Cored
NIBS FOR ALL HEADING TOOLING APPLICATIONS



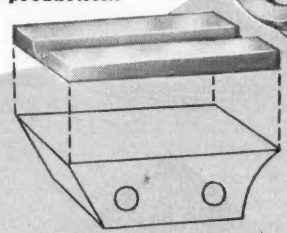
Rough Cored
SOLID AND SHELL TYPE MANDREL NIBS FOR TUBULAR PRODUCTS



Carbide
INSERTS FOR NAIL TOOLING APPLICATIONS



Rough Cored
NIBS FOR EXTRUDED AND DEEP-DRAWN PRODUCTS



Carbide
FOR SPRING FORMING TOOLS AND WEAR-RESISTANT PARTS

R-294

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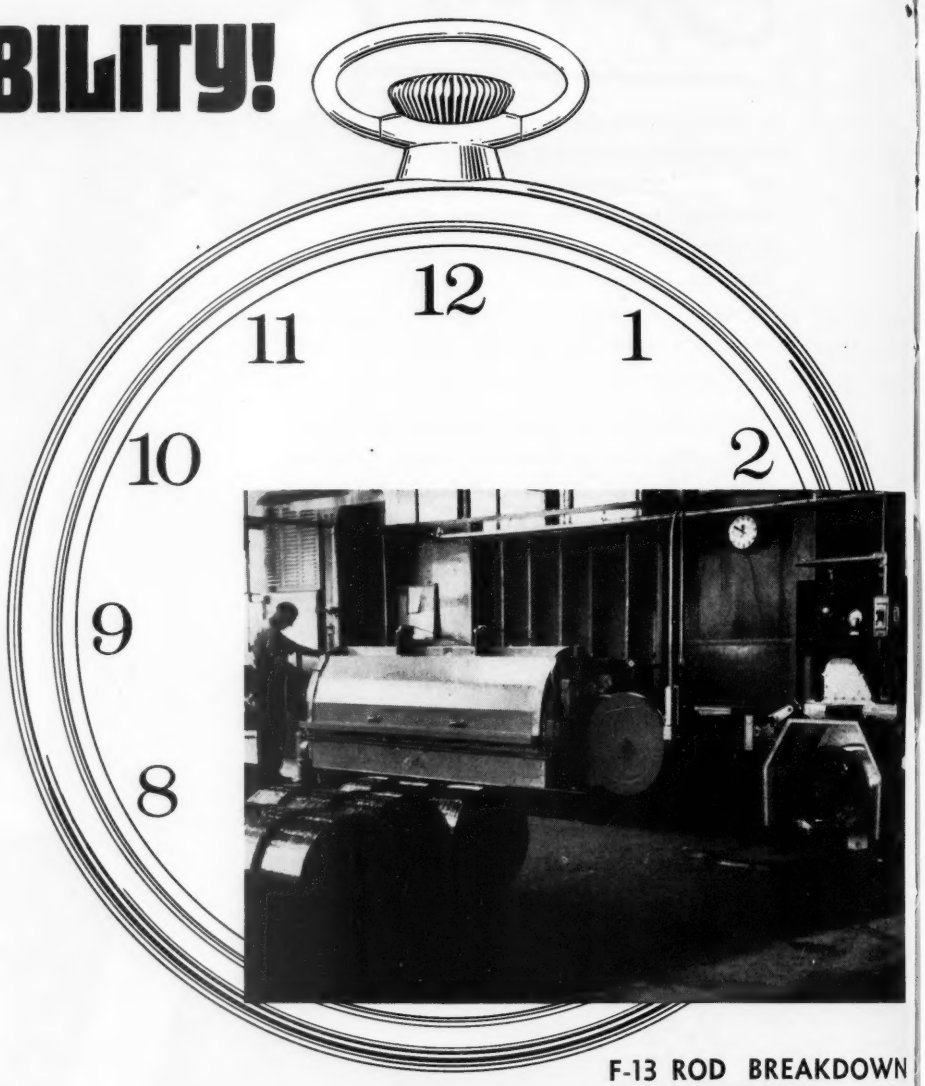
High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets

we build wire machinery,

for... "AROUND THE CLOCK"

DEPENDABILITY!



F-13 ROD BREAKDOWN MACHINE

Better Machinery for the Wire Industry

WE invite YOU to share our experience and facilities as designers and constructors of Quality WIRE Equipment.

SYNCRO®

MACHINE COMPANY

PERTH AMBOY • NEW JERSEY • USA

WIRE DRAWING MACHINES - STRANDERS - DIE STRINGERS - CONTINUOUS ELECTRIC ANNEALERS - CAPSTANS - WIRE INSULATORS - HEAVY DUTY TAKE-UPS - TAPERS

AFFILIATED COMPANY: WINGET-SYNCRO, ROCHESTER, KENT, ENGLAND

Comfort starts with *Steel*

Nothing else provides the same lasting comfort—in sleeping, sitting or riding—as well-designed upholstery springs. Especially when springs are made from Silver Star Spring Wire.

Silver Star is a special-purpose, high-carbon wire. From the time the steel is melted until the finished product receives final inspection, it's a wire that's engineered solely for upholstery requirements. It coils and knots easily on high-speed production lines. Always uniform in its properties, it makes lively springs that keep their bounce through years of hard service.

Whenever you think of wire, think of Bethlehem. Here are some other specialties in steel wire that you can count on for top quality:

★ Border and Brace Wire (high- and low-carbon grades)
★ High-Tensile Wire for serpentine types of springs and other special uses
★ Hog-Ring Wire
★ Low-Carbon Frame Wire for spot welding
★ Link-Fabric Wire
★ Low-Carbon Crimping Wire

If you're interested in wire for any purpose, drop us a letter at Bethlehem, Pa., and we'll see that you get complete information promptly.

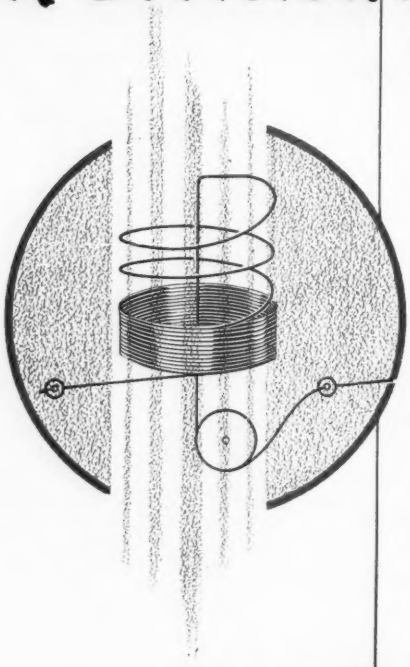
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM WIRE

BETHLEHEM STEEL

AIR Efficiently Applied...



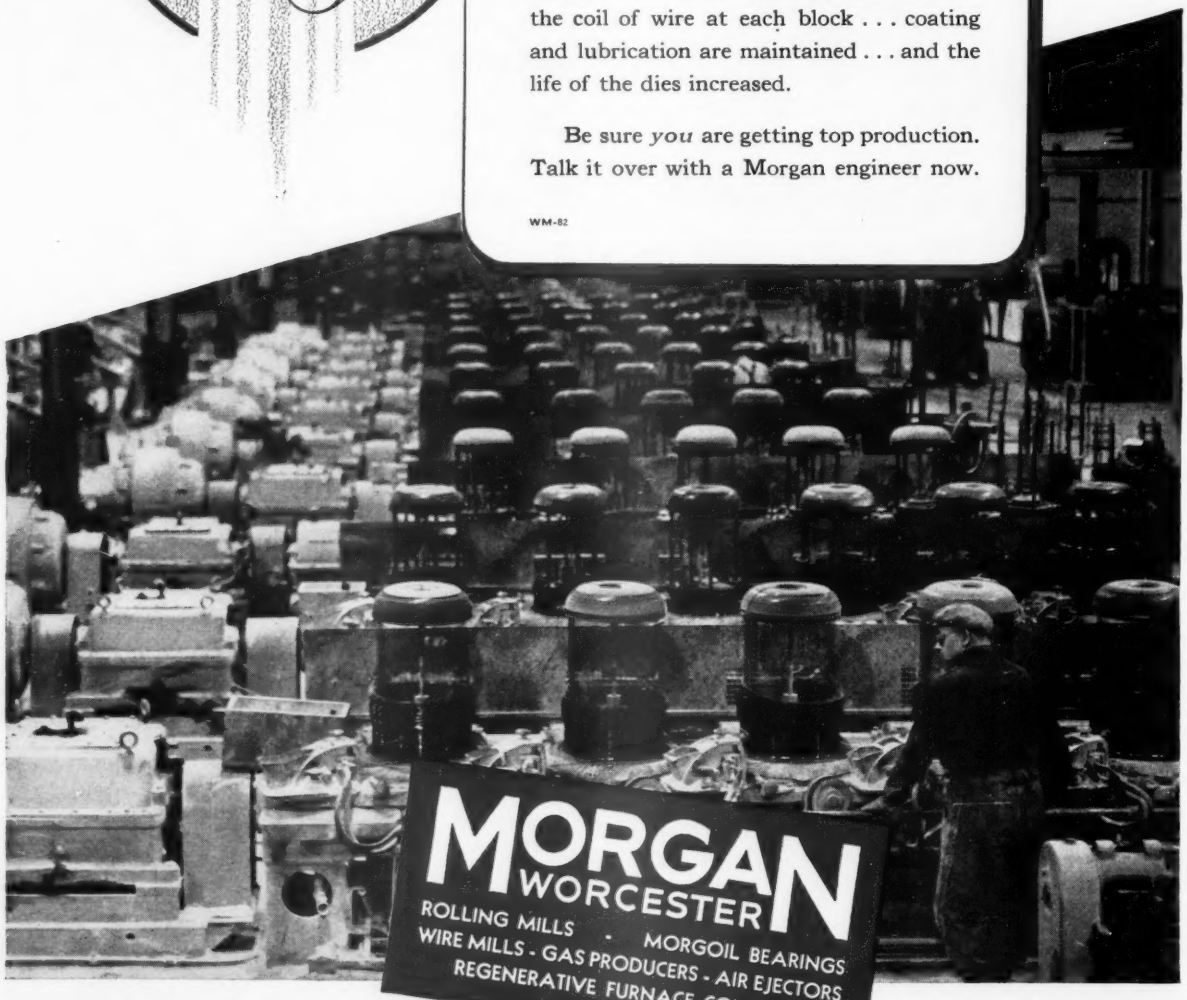
keeps these MORGAN-CONNORS producing at high speeds

Because of this fast and efficient air cooling high carbon wire can be drawn at high speeds, and meet the most exacting physical specifications.

Air is blown *up through* and *around* the coil of wire at each block . . . coating and lubrication are maintained . . . and the life of the dies increased.

Be sure *you* are getting top production. Talk it over with a Morgan engineer now.

WM-82



MORGAN CONSTRUCTION COMPANY • WORCESTER, MASSACHUSETTS

WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 29 APRIL, 1954 No. 4

Designated as Official Publication By The Wire Association

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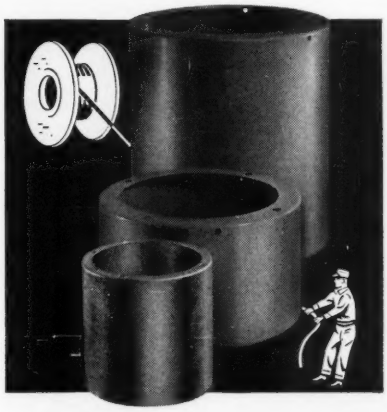
Republic

FLANGED STEEL TRAVERSES



are:

1. Light in weight
2. Durable
3. Strong
4. Easy to assemble
5. Smooth—free from rough spots that might damage plastic-covered cable.

Made in sizes up to 56-inch diameter and 48-inch traverse—in plain, painted or hot dip galvanized finish—as light as 18-gauge steel. Width of flange and number of bolt and drain holes furnished to your specifications. Available for prompt delivery. Write for prices.

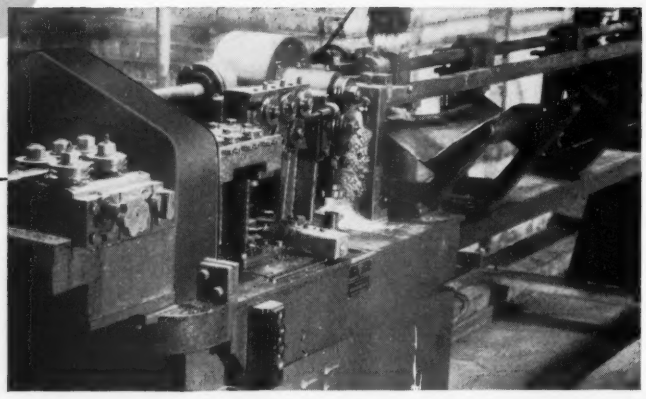
* * *

Manufactured under license arrangement with Western Electric Co., Inc.

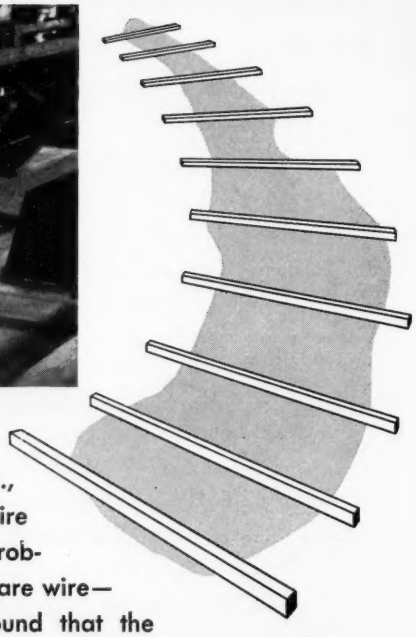
REPUBLIC STEEL

PRESSED STEEL DIVISION
REPUBLIC STEEL CORPORATION
NILES, OHIO

DRISCOLL WIRE SOLVED IT with a SHUSTER



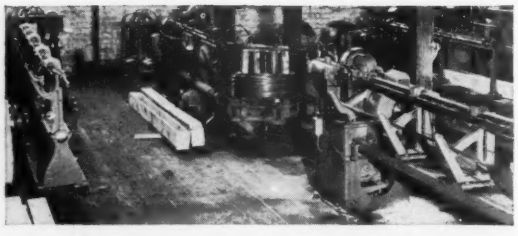
SHUSTER 2ABF in operation at Driscoll.



The Driscoll Wire Co., Shelton, Conn., one of the oldest names in reliable wire manufacture, was faced with the problem of straightening and cutting square wire—for long production runs. They found that the SHUSTER 2ABF was the one, satisfactory answer.

Outstanding features of the 2ABF are: instantaneous operation of clutch and cutoff; movement of wire almost continuous, minimizing marking of the wire and assuring square cut, undistorted ends; although built primarily for square and rectangular wire, the 2ABF will straighten and cut round wire as well; maximum capacity — ¼" sq. & rect. (⅜" round).

Write for our new circular



At left is a view in the fine wire room at Driscoll, where some of the many SHUSTERS in the plant are on 24 hour duty.

Manufactured by

METTLER MACHINE TOOL, INC.

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Fine Craftsmanship begins with

ELGIN DIAMOND

AT

JOHNSON STEEL & WIRE CO.

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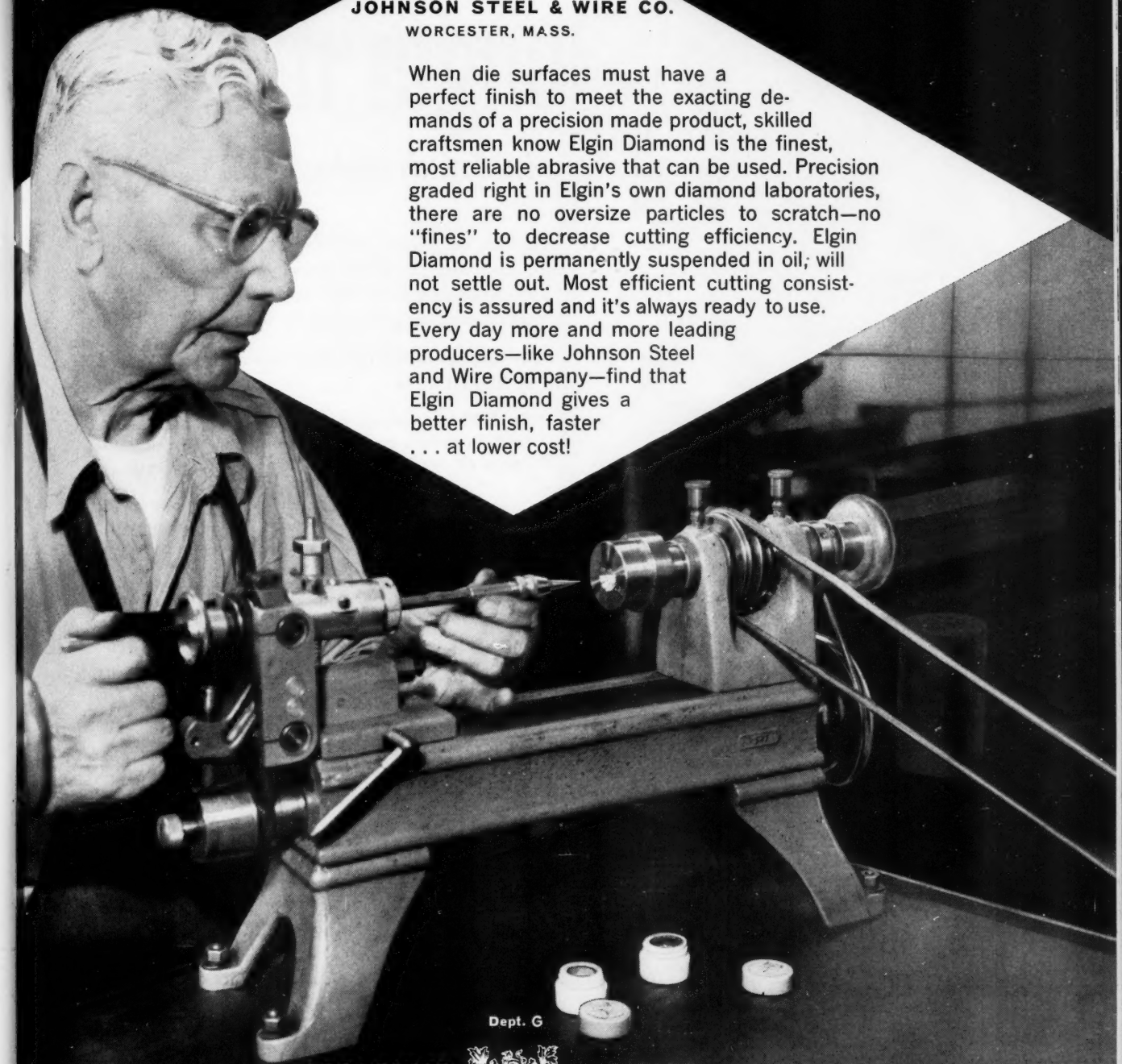
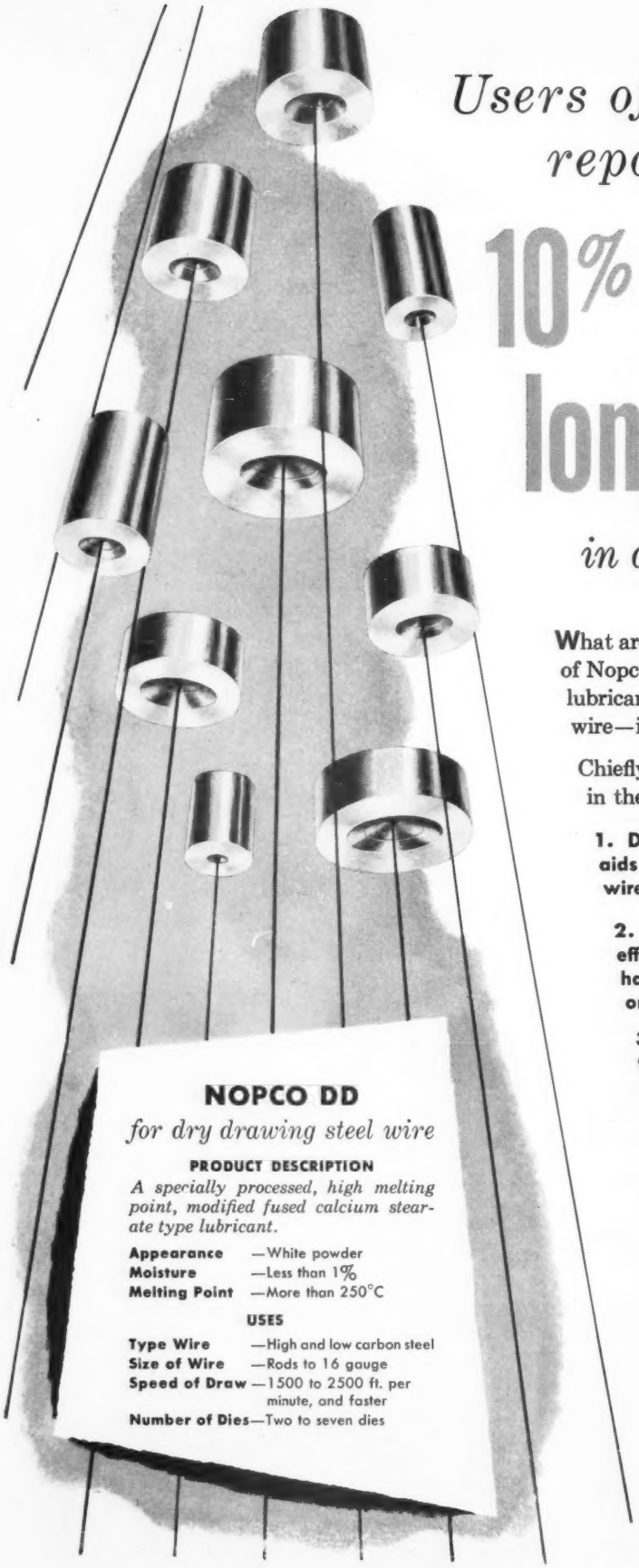
When die surfaces must have a perfect finish to meet the exacting demands of a precision made product, skilled craftsmen know Elgin Diamond is the finest, most reliable abrasive that can be used. Precision graded right in Elgin's own diamond laboratories, there are no oversize particles to scratch—no "fines" to decrease cutting efficiency. Elgin Diamond is permanently suspended in oil; will not settle out. Most efficient cutting consistency is assured and it's always ready to use. Every day more and more leading producers—like Johnson Steel and Wire Company—find that Elgin Diamond gives a better finish, faster . . . at lower cost!



Dept. G

ABRASIVES DIVISION

ELGIN NATIONAL WATCH COMPANY



Users of **NOPCO® DD** *report:*

10% to 50% longer die life

in dry drawing steel wire

What are the reasons why Nopco DD, recent product of Nopco research, is almost certainly superior to the lubricant you are now using for dry drawing steel wire—including galvanized or plated wire?

Chiefly, because it excels all other lubricants in these 3 ways:

1. **DD's specially processed calcium stearate base aids in surface tension—makes the soap stick to the wire all the way through the drawing process.**

2. **DD's soft film of combined coating and soap effectively separates wire and die—as compared to harsher soaps which have an abrasive action on the die.**

3. **Perhaps most important of all, because the melting point of DD is over 250°C. It does not "burn out" and lose effectiveness like other low melting point soaps often used.**

Though Nopco DD has been available only a year, plant after plant has adopted it—strictly as a result of its performance in their own comparative tests. Isn't it high time *you* tried it? We'll gladly help by furnishing full information and samples for testing. Write today.

NOPCO DD

for dry drawing steel wire

PRODUCT DESCRIPTION

A specially processed, high melting point, modified fused calcium stearate type lubricant.

Appearance —White powder
Moisture —Less than 1%
Melting Point —More than 250°C

USES

Type Wire —High and low carbon steel
Size of Wire —Rods to 16 gauge
Speed of Draw —1500 to 2500 ft. per minute, and faster
Number of Dies—Two to seven dies

NOPCO CHEMICAL COMPANY
Harrison, New Jersey
Cedartown, Ga. • Richmond, Calif.

NOPCO TRADEMARK EVOLVED THRU RESEARCH

TESTS DEMONSTRATE EFFECTIVENESS OF...

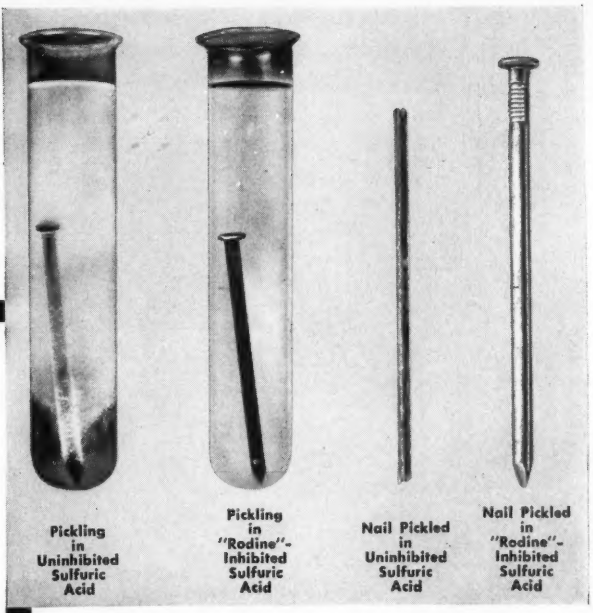
Trade Mark

RODINE

Reg. U.S. Pat. Off.

PICKLING ACID INHIBITOR

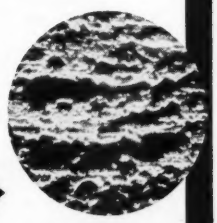
"Rodine" more than pays for itself in savings of acid and metal. More uniform pickling and better pickled surfaces are obtained when "Rodine" is used in acid pickling baths.


Pickling in Uninhibited Sulfuric Acid
Pickling in "Rodine"-Inhibited Sulfuric Acid
Nail Pickled in Uninhibited Sulfuric Acid
Nail Pickled in "Rodine"-Inhibited Sulfuric Acid

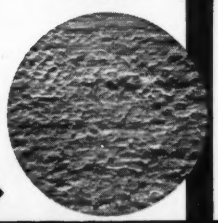
The photographs above illustrate the beneficial effect produced by a small amount of "Rodine" in a pickle bath.

A. Both test tubes contain a 10 per cent by volume solution of sulfuric acid. In the left-hand tube, no further additions have been made to the acid. Notice the gas bubbling off the nail. This is hydrogen, caused by the action of acid on good metal. In the right-hand tube, "Rodine" has been added in an amount equal to 1 per cent by volume of the concentrated acid. Notice the absence of bubbling in this tube. "Rodine" prevents the formation of hydrogen that results from dissolving metal.

B. Both nails after being pickled for the same time. The nail pickled with "Rodine" has lost little weight and has retained its original luster and appearance. The nail pickled without "Rodine" is no longer a nail. "Rodine" prevents the acid from dissolving metal.



This steel surface was pickled in an uninhibited acid bath. Note the deep pits, and that the surface is visibly crystalline.



This surface was pickled exactly like the one above except that "RODINE" was added to the acid solution. Only scale pockets and roll marks are visible; no pitting occurred.

CHEMICALS ACP PROCESSES

AMERICAN CHEMICAL PAINT COMPANY

General Offices: Ambler, Penna.

Detroit, Michigan Niles, California Windsor, Ontario

SHERATON HOTELS

NAME Apex Alkali
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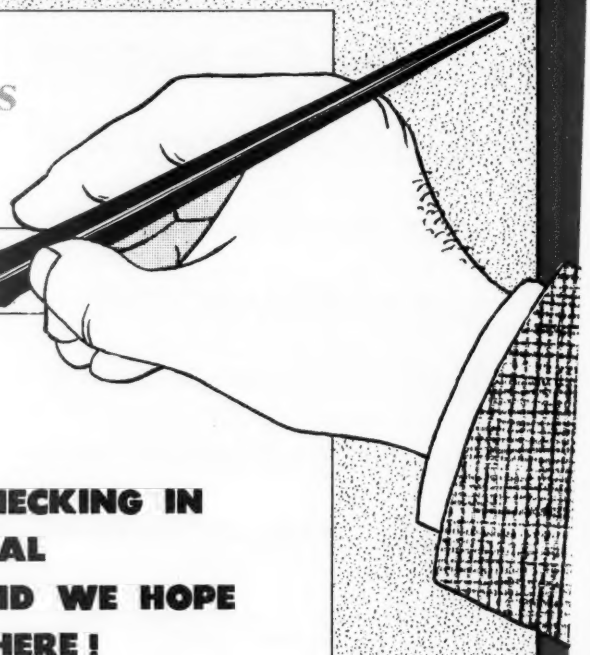
CITY Philadelphia



WE'RE CHECKING IN FOR THE REGIONAL MEETING AND WE HOPE TO SEE YOU THERE!

Whether to just say "Hello" or to solve some real problems, it will be fine to have you visit us.

April 22 and 23

Welcome

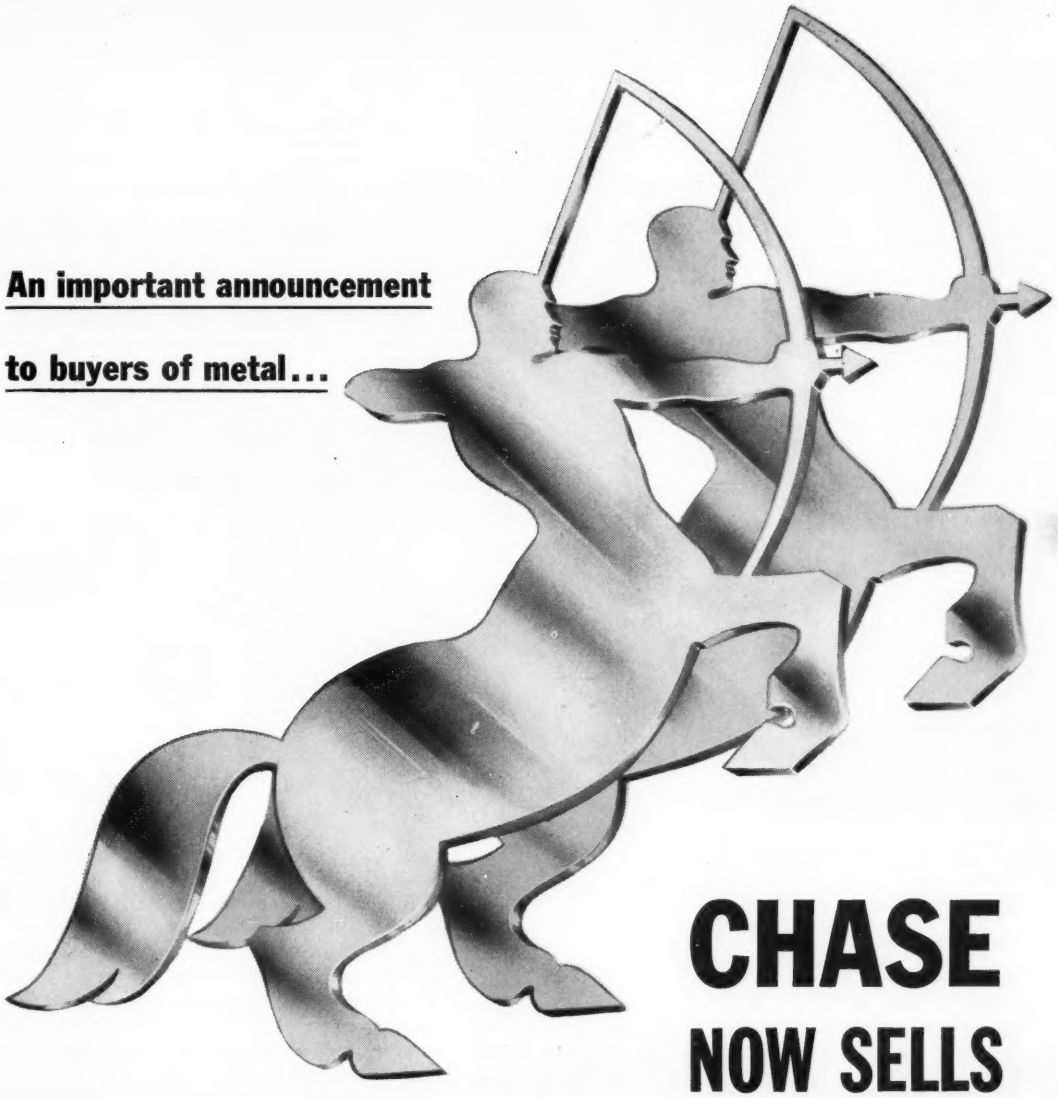
APEX ALKALI PRODUCTS COMPANY

Lubricants & Cleaning Compounds for Wire and All Wire Products

Main and Rector Streets · Philadelphia 27, Pa. · IV 3-3939

An important announcement

to buyers of metal...



CHASE NOW SELLS STAINLESS STEEL, TOO

Sheets, Plates, Bars, Wire, Pipe and Tubing now available through Chase warehouses and sales offices

Now you can get Stainless Steel from Chase! Along with our regular brass and copper products, Chase can now supply Stainless Steel.

This line has been added as an extra service to metal buyers. Now you can get Stainless Steel, brass and copper from the same source. The same cutting facilities provided on regular Chase products are now available on Stainless Steel orders, too. Anything not in stock locally can be shipped promptly from another Chase warehouse or from the mill.

For service...for quality... in Stainless Steel, too, call your nearest Chase warehouse or sales office.

Chase®

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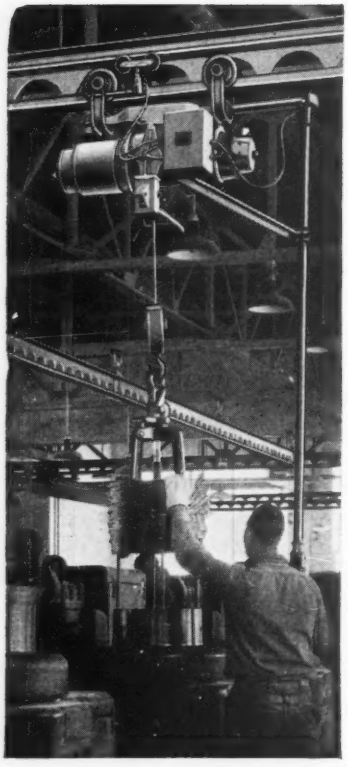
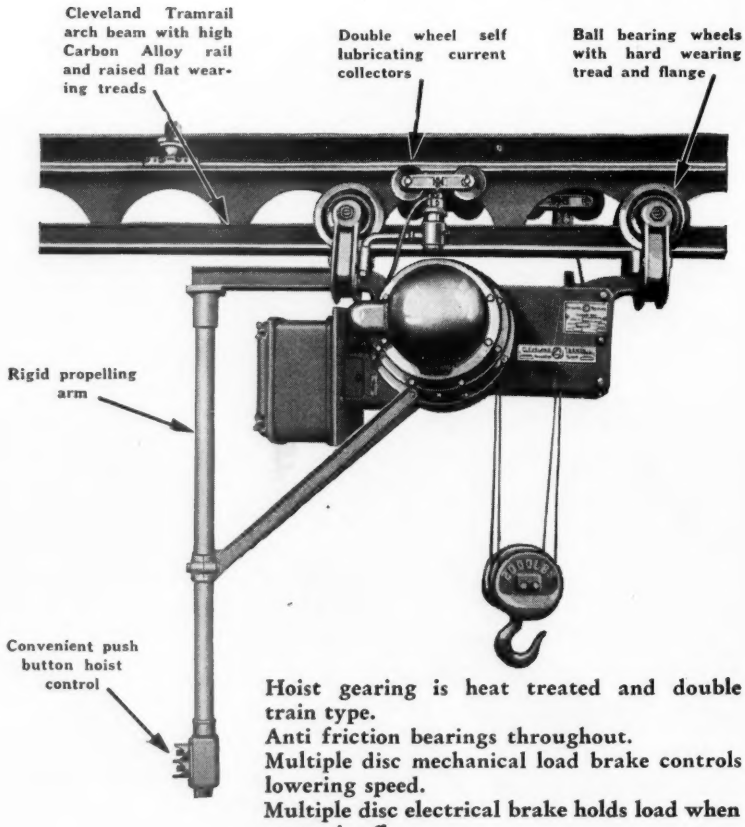
The Nation's Headquarters for Brass & Copper

CHASE BRASS & COPPER CO., WATERBURY 20, CONN., Warehouses and Sales Offices at:— Albany† Atlanta Baltimore Boston Chicago Cincinnati Cleveland Dallas Denver† Detroit Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester† St. Louis San Francisco Seattle Waterbury (†sales office only)



Block stripping is faster, easier and safer when served by Cleveland Tramrail.


Cleveland Tramrail arch beam with high Carbon Alloy rail and raised flat wearing treads
Double wheel self lubricating current collectors
Ball bearing wheels with hard wearing tread and flange
Rigid propelling arm
Convenient push button hoist control

Hoist gearing is heat treated and double train type.
Anti friction bearings throughout.
Multiple disc mechanical load brake controls lowering speed.
Multiple disc electrical brake holds load when power is off.
Stabilizing rollers under rail to minimize tilting of rigid arm when operating on crane.
Machine grooved winding drum with plow steel wire rope.
Motor and controller especially designed for hoist service.
Entire gear train operates in oil bath which also lubricates all bearings and mechanical load brake.
All parts readily accessible and easily replaced.

BLOCK STRIPPING HOIST CARRIERS

Built for Long Time Smooth Performance

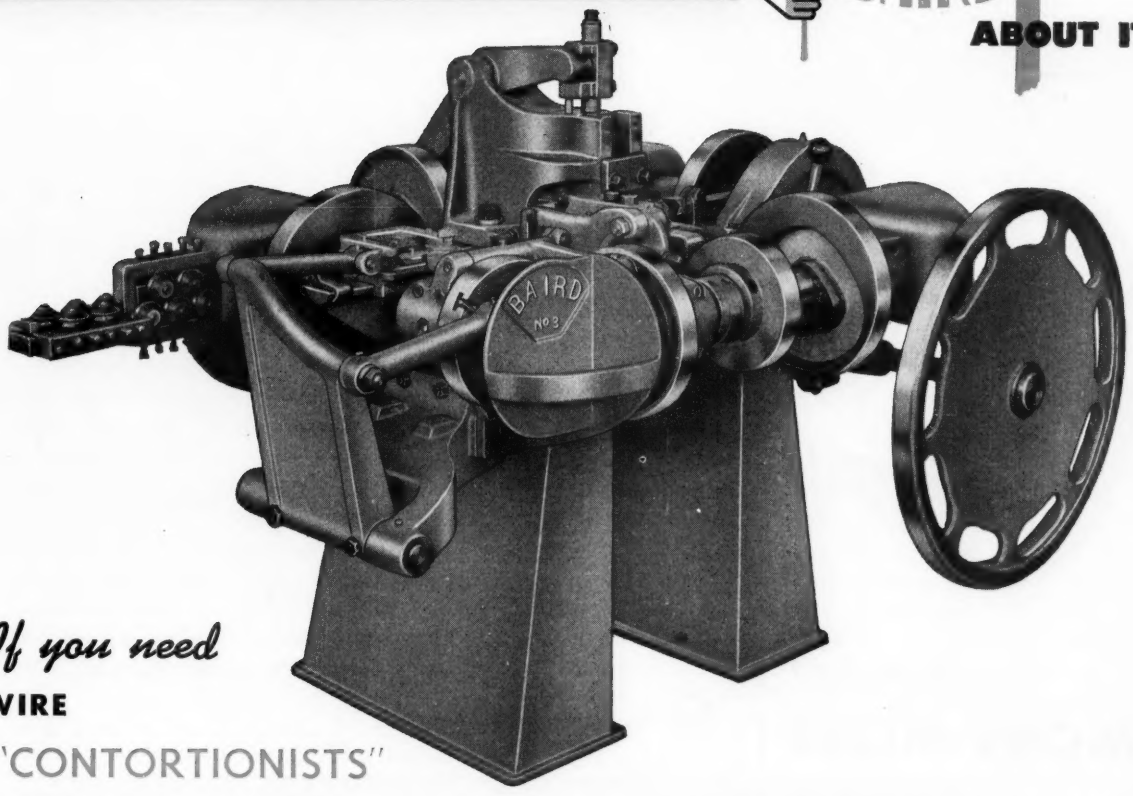
GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
9206 East 288th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

. . . IF IT'S A HIGH PRODUCTION PROBLEM . . .

ASK BAIRD ABOUT IT



If you need
WIRE
"CONTORTIONISTS"

The BAIRD FOUR-SLIDE is your FORMING MACHINE

There is probably no machine in the world that can make a greater variety of parts . . . or produce them any faster . . . than the Baird Four-Slide. It seems that there must be a limit to the fashioning of small wire and metal ribbon products *by hand* . . . and then tooling a Baird Machine to make them *automatically.* Yet, new shapes are continuously submitted to us . . . and we still find the solutions.

Taking coiled wire from a reel, the machine straightens, feeds, and cuts off the required length . . . then forms and ejects the part. Different sizes of standard machines give you a selection of wire lengths to 32½" . . . dia. to ½" or flat ribbon metal products to 1½" wide. Special attachments such as *secondary cut-offs, lettering, form raising, pin pulling, nail pointing, vertical forming and stripping, ring setting, etc.,* extend the versatility of operations.

Thus you may purchase your machines for specific repetitive production, then, at any time, add special attachments as your production requirements indicate. At all times you may count on Baird engineers for development of tooling from your parts or specifications.

This is your profit-making machine. Send for the Baird Four-Slide Bulletin.

2BA54

THE BAIRD MACHINE COMPANY
STRATFORD CONNECTICUT

WHERE YOU WILL GET THE HELP OF SPECIALISTS ON THESE ESSENTIAL PRODUCTION PROBLEMS:

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

Gives You

MORE MILES PER DOLLAR

Also a New 150 Yarn

This new 150 yarn with 300 filaments gives you a very smooth wire, with minimum fuzzing, thus reducing scrap. The finer, more flexible filaments make a yarn which is more abrasion resistant, which bends readily without breaking.

1 Control of spread and build

New medium twist permits more flexibility and better control of spread and build... *more miles per dollar!*

2 Inventory reduction

Each of these medium twist packages will do a wide variety of jobs and thus cut yarn inventory as much as one third.

3 Smooth, uniform wire—minimum fuzzing

Tests show that this medium twist yarn reduces fuzzing to a minimum, resulting in a smooth finish.

THE SECRET IS UNIFORMITY

The advantages offered by this new medium twist 300 yarn are directly attributable to uniformity: uniformity of the yarn itself, and uniformity both in size and quality of the package. And for that the credit must go to the Electronic-Extrusion process, which produces glass filaments of consistently uniform diameter. *No other maker of glass fibers uses this process.*

For information and samples, write to Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, Ohio.

GLASS FIBERS *INC.*

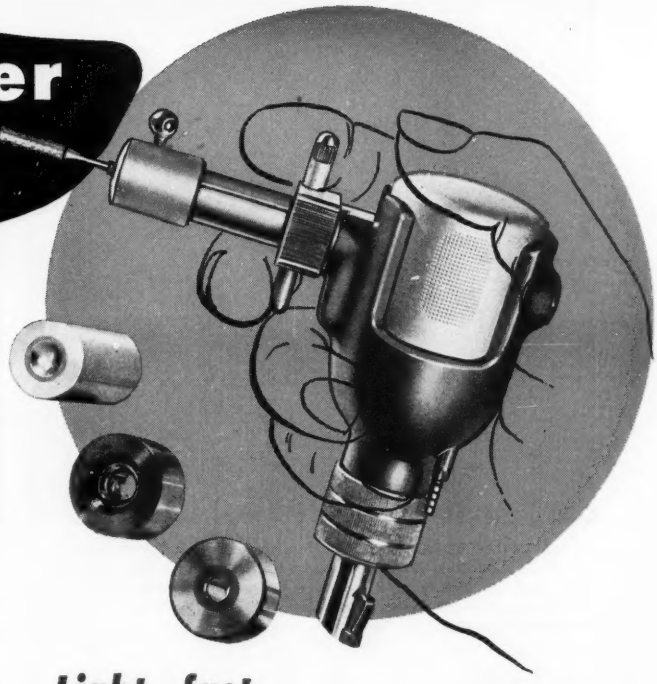
Makers of glass fibers by the ELECTRONIC-EXTRUSION process ... developed, patented and used exclusively by Glass Fibers Inc.

VITRON Yarns • Rovings • Micro-Fibers • **DURAMAT** Vapor Barriers **BLUE FLAG** Pipe Wrap • **MICROLITE** Thermal and Acoustical Insulation • **VIBRAGLASS** Mounting and Packaging Materials **COUSTIC-AIRE** and **THERMO-JET** Aircraft Insulations

The Di-Profiler

(U.S. Pat. Pend.)

Reciprocating Hand Machine



Saves Costly Hours On Dies and Molds

Faster, and far superior to manual techniques, the Di-Profiler is indispensable for cutting, lapping and polishing operations involving flat or curved surfaces on regular or irregular drawing dies.

Complicated and intricate dies and molds are finished in a fraction of normal time by using this efficient and precise machine with standard Di-Profiler diamond and tungsten-carbide tools.

In die and mold shops throughout the country, the Di-Profiler has paid for itself many times over through labor-saving cost reductions.

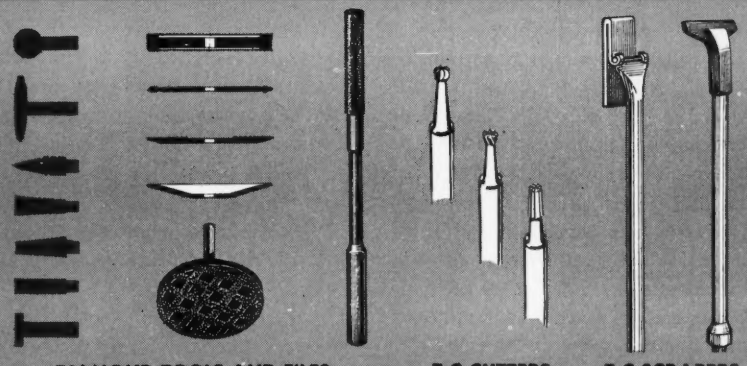
The low price permits placing the Di-Profiler in the hand of every operator in your shop.

Light, fast, variable speed and stroke

The Di-Profiler is rapid, precise, easy to operate—simple and sturdy in construction. Its weight of less than one pound and freedom from vibration eliminate fatigue and assure perfect control during operation.

The Di-Profiler has an adaptable stroke variable from 0 to 6mm (¼"), and a speed of reciprocation that can be varied from 0 to 100 strokes per second—a versatility that proves useful for every type of job.

Complete Stocks of T-C Cutters; Diamond Files, Disks, Points, Burrs, Scrapers



DIAMOND TOOLS AND FILES — T-C CUTTERS — T-C SCRAPERS

Immediate service on parts, replacements, repairs

See a demonstration of the Di-Profiler at space 124, Precision Hall, A.S.T.E. Exposition

ENGIS EQUIPMENT CO.

431 South Dearborn Street • Chicago 5, Illinois

Exclusive Distributors for the United States

1. THESE LARGE REELS of steel wire are manufactured to the exact specifications of the Roto-Rooter Corporation. Here Roto-Rooter employee Glen Anderson operates an electric hoist to transfer a reel of wire to the coil forming machine, where it is formed into one of the various sizes of flexible cable used in the Roto-Rooter machines.

2. ILLUSTRATED HERE is the coiling machine which is used to place the bulk cable coming from the coiling machine into the Roto-Rooter machine reels.

"That AS&W wire is really wire!"

says R. A. YOUNG,

Secretary of the Roto-Rooter Corporation, Des Moines, Iowa

"Our business is making machines*—a special sewer and drain-cleaning machine called the Roto-Rooter. Strict specifications are followed in the manufacture of the Roto-Rooter, especially in the flexible steel cable which is the heart of the machine. That cable must be really tough — strong enough to withstand the acute twisting action of the revolving reel, flexible enough to negotiate the sharpest bends and turns, highly resistant to the corrosive elements found in all sewers. That cable absorbs a terrific beating, and naturally it must be fabricated from an especially high grade steel wire.

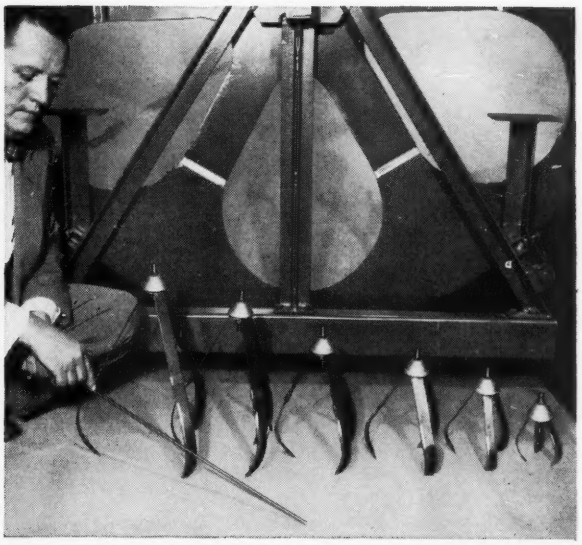
"We found the kind of wire we need at American Steel & Wire. Our engineers got together with the AS&W metallurgists, working out the heat treating and hardness specifications. The wire we get from AS&W is made especially for us, and is not used by any other manufacturer. One of the things we like best about AS&W is their constant adherence to our close-tolerance specifications. And we're more than satisfied with the terrific performance of the steel wire in our machines. That AS&W wire is *really* wire!"

* * *

The experience of the Roto-Rooter Corporation is not unusual. Thousands of manufacturers all over the country have learned to depend on the consistently high quality of USS American Manufacturers Wire. A better-grade steel wire enables you to do a better fabricating job . . . and often saves you money, too.

American Steel & Wire carries, *in stock,* over 400 different types of American Manufacturers Wire, including Stainless, for you to choose from. For special requirements, our trained staff will work with you to develop a new wire that will meet your specifications exactly. Why not let us help you with *your* steel wire problems? If you make it of wire, make it of the best—USS American Manufacturers Wire.

3. EMPLOYEE J. B. THOMAS is shown attaching the steel cutting blades to flexible steel cable on the Roto-Rooter machine. The revolving reel shown on the right housed 120′ of this ¾″ AS&W steel cable. In the background can be seen the stockpile of finished cables ready for installation in the machine.



4. N. W. LARSEN of the Roto-Rooter Corporation shows the various sizes of Roto-Rooter cutting blades. In operation, the blades are attached to the end of the flexible cable and receive their cutting motion from the revolving reel at the opposite end through the steel cable.

5. AND HERE'S a finished Roto-Rooter in operation with the cutting blades about to be inserted into the sewer line. The razor sharp, high-speed rotating blades cut all roots, grease, scale, and other debris into tiny pieces, leaving the line as clean as the day it was installed. The specially-designed steel cable has to absorb a terrific beating in negotiating the sharp turns and bends found in domestic sewer lines—as high as four or five 90° turns in one operation. It's easy to see why the Roto-Rooter Corporation insists on the highest standards of quality in the steel wire they use in these cables . . . and why they use American Manufacturers Wire exclusively.

*Roto-Rooter is a nationwide sewer service and Roto-Rooter machines are placed only on an exclusive franchise basis.

If you make it of wire...
make it of the best!

U S S AMERICAN MANUFACTURERS WIRE

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High-quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire.*

USS TRADE MARK

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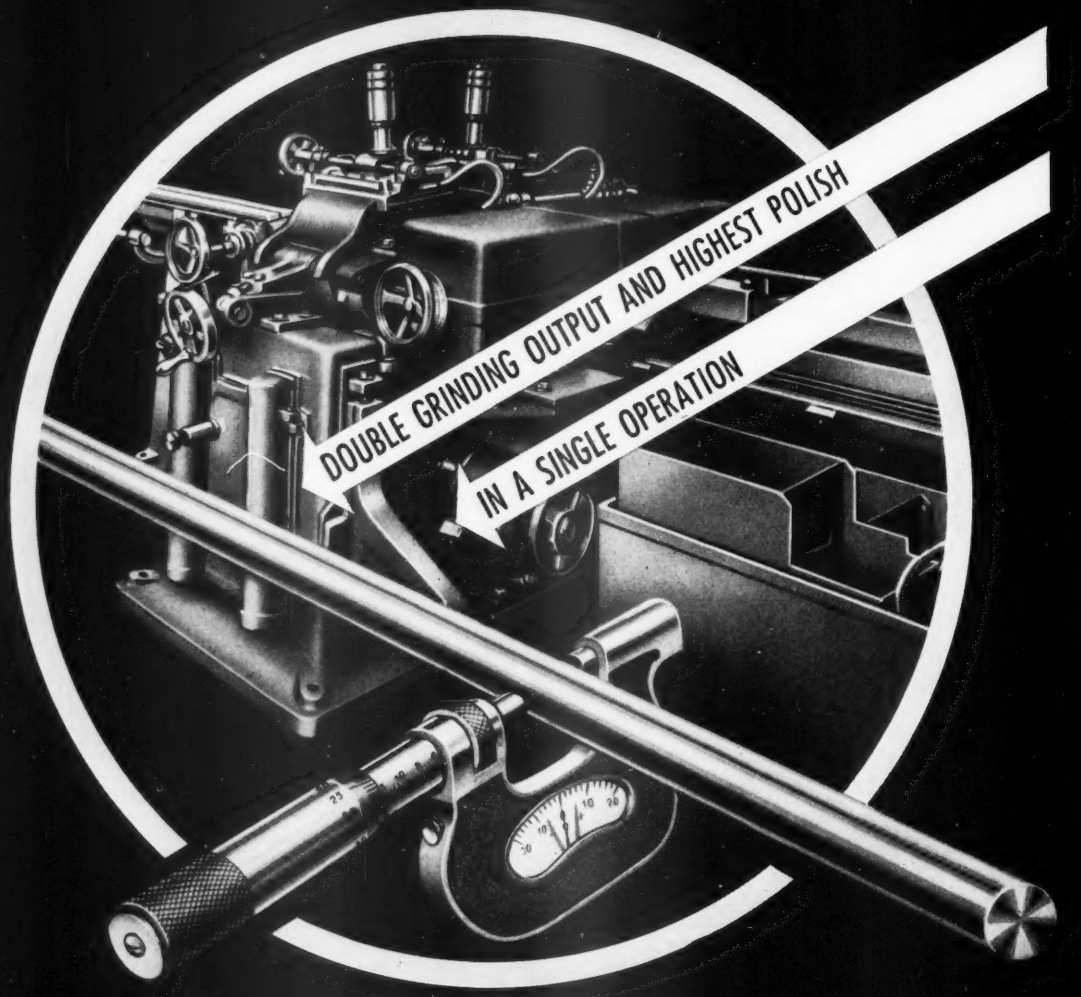
CENTERLESS BAR GRINDING AND POLISHING MACHINE



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Fisk Building, New York 19, N.Y.

NATIONAL

WIRE

(COLD ROLLED)

in Coils or Straight Lengths

COMPLETE METALLURGICAL SERVICE

Manufacturers of

SPRING WASHERS	RETAINING RINGS
ROUND EDGE FLAT WIRE	KEYSTONE SHAPED WIRE
SQUARE EDGE FLAT WIRE	SPECIAL SHAPED WIRE

Shaped Wire in Coils or Straight Lengths, Ferrous or Non-Ferrous.

LARGE OR SMALL QUANTITIES

Manufactured by

THE NATIONAL LOCK WASHER COMPANY

PRECISION SHAPED WIRE DIVISION

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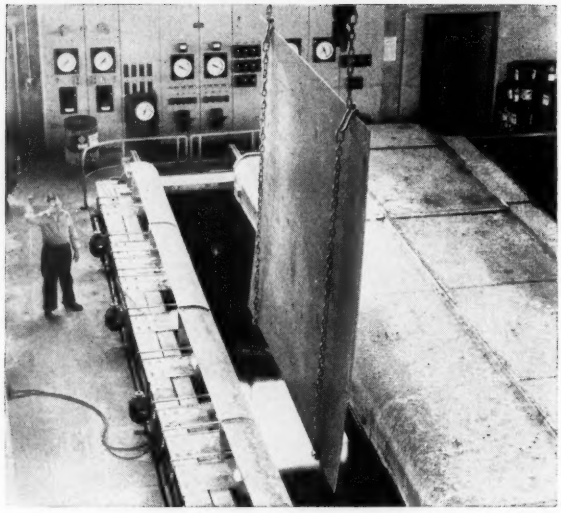
You can quickly descale work of any size or shape

with the

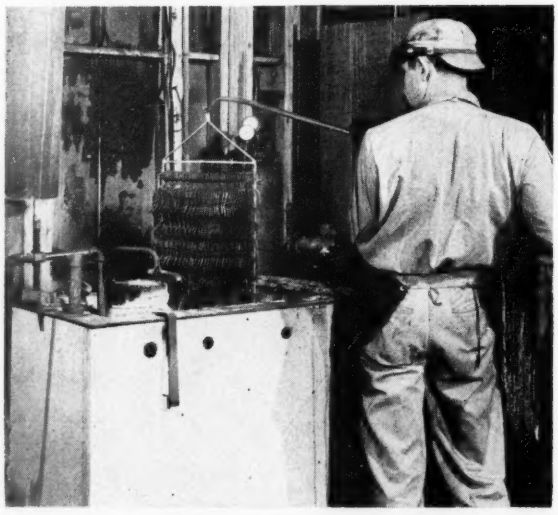
DU PONT SODIUM HYDRIDE DESCALING PROCESS



There's no limit to the size or shape of parts that can be thoroughly descaled with the versatile Du Pont Process. Sodium hydride descaling works as efficiently on small precision parts weighing ounces as on large steel plates weighing tons!

This range of performance is just one of the many profitable advantages of the modern Du Pont descaling process. You can completely descale most metals separately or in combination in just *one* fast cycle (10 to 20 minutes)—retreatments are rarely needed. There's never any danger of pitting or etching, never a costly reject due to loss of gauge. Base metal is *always* protected since bath action stops the instant scale has been reduced. And expensive scale-breaking operations (necessary for older descaling methods) are eliminated entirely!

If you are descaling metals which are unaffected by fused caustic at 700°F., it will be to your advantage to talk with us about the Sodium Hydride Process. Du Pont pioneered this modern descaling method and can bring a depth of technical experience to bear on your descaling problems. There's no cost for this service, which includes expert aid in the construction, installation and operation of the process. Just call our nearest district office or send the coupon below.



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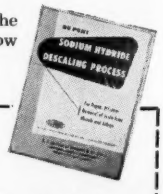
Check coupon below for booklet describing the Du Pont Sodium Hydride Descaling Process—how it works—what it can do for you.



E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department WW-44
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☐ Please send me your free booklet on Sodium Hydride Descaling.

☐ Please have one of your technical men call. I am interested in descaling _____.

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DU PONT
Sodium hydride process for positive descaling

DU PONT
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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Specify STEELSKIN

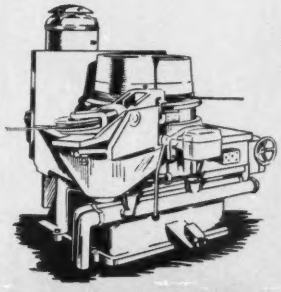
for dependable lubricants... dependable results!

It's fundamental!

1 You hire technicians, you hire engineers who have experience, know-how and integrity... because you know you can depend on them to do their jobs.

2 You buy machinery—from manufacturers on whom you have learned you can depend for quality equipment—manufacturers who stand squarely behind the products they produce.

You know you can depend on them.



Shop foremen who have tried Steelskin lubricants *know* they can depend on Steelskin's consistent quality year after year... know they can rely on Steelskin's uniform composition, and texture. They know that Steelskin gives greater die-life, more uniformity, better quality in the wire products they produce. What's more, they know Steelskin's engineers are always ready to assist them with wire-drawing problems.

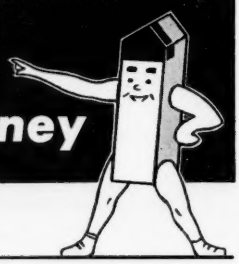
It adds up. Better specify Steelskin Wire Drawing Lubricants for your plant.

WRITE TODAY for complete information on STEELSKIN SOAPS and COMPOUNDS.

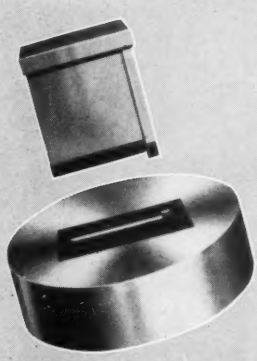
Steelskin LUBRICANTS

R. H. MILLER
Company, Inc., Homer 1, N. Y.

Production Records Prove *Talide Dies* Save You Money

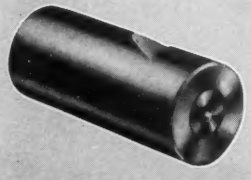


● 137,000 hi-alloy steel Pressure Vessels deep drawn through a TALIDE Sheet Metal Die—with buffing and polishing costs cut 80%—downtime 98%—and scrap 100%. Best production from steel die used previously was 7,900 cylinders before wearing oversize.



BLANKING AND FORMING DIES

Over 5,000,000 abrasive paper discs blanked out with a TALIDE Blanking Die—70 times more than produced with hard alloy dies used previously.

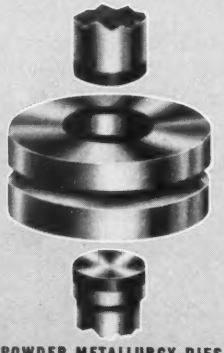


HEADING AND EXTRUSION DIES

Costly cold-heading job on 3/4" carriage bolts producing only 50,000 pcs. per steel die made profitable with average 1,500,000 piece production runs with TALIDE Cold-Heading Dies.

CURLING ROLLERS

Large Can Company reports TALIDE Curling Rolls last 65 times longer than steel rolls on beverage can forming operation—with edges free from burrs and cracks.



POWDER METALLURGY DIES

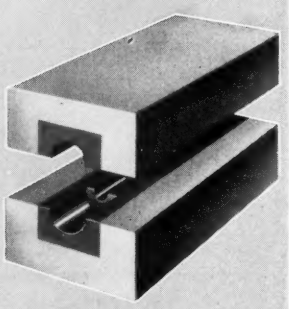
Large Pharmaceutical Company reports TALIDE Pill Dies not only produce tablets having a superior surface glaze which reduces rejects 82%—but also outlasts steel dies 100 to 1.

TUBE MANDRELS

12 days (36 shifts) of continuous trouble-free production obtained by eastern Brass Mill with TALIDE Tube Drawing Mandrels—compared to average 8-hr. runs obtained with steel mandrels.

DRAWING DIES

50 miles of tough 5" alloy steel tubing (actually 252,000 ft.) drawn by large midwestern Steel Mill through TALIDE Tube Die compared with a normal run of 10,000 ft. with a steel die.



SWAGING DIES

Leading Fountain Pen Manufacturer cold swages an average of 750,000 stainless steel sleeves with TALIDE Swaging Dies — 33 times more than with chrome-plated dies.

● Available in size range from .010 to 24" I.D. and in any shape, Talide Dies meet every requirement. Uniform quality and consistent performance are assured by 21 grueling tests including physical, chemical and metallographic. Send us prints or parts of your particular die application for estimate and recommendations. **Metal Carbides Corp., Youngstown 7, Ohio.**

Send for new 84-page Catalog 54-G or ask for sales engineer to call.

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SINTERED CARBIDES · HOT PRESSED CARBIDES

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STEEL TRAVERSES

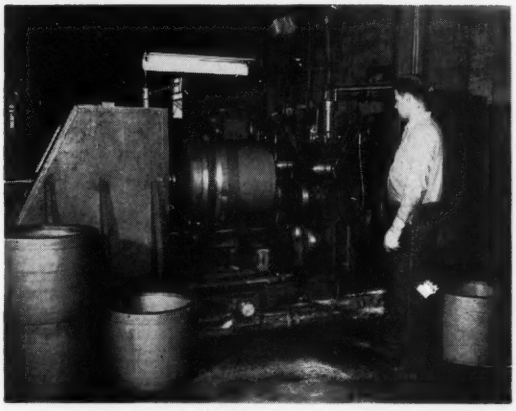
FLANGED STEEL DRUMS FOR REELS
for
WIRE ✦ CABLE ✦ WIRE ROPE

Plain finish . . .

Painted finish, or . . .

Galvanized finish (Hot dipped)

- **For use with nailed, plywood, metal bound and cast flanges. Made from a single sheet of metal—rolled—welded—flanged, with bolt holes punched to your specifications.**



SAVES COST in assembly of reel by eliminating handling of larger number of small parts.

SAVES COST by making repairs easy.

SAVES COST by increasing reel life.

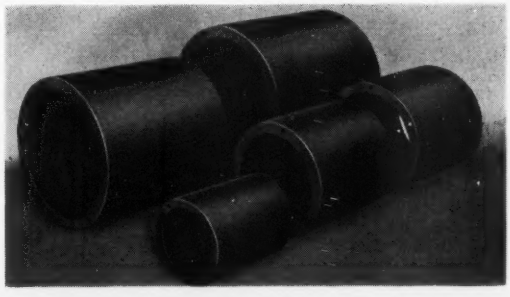
SAVES COST by reducing damage to wire and cable.

LATEST SEMI-AUTOMATIC FLANGING EQUIPMENT AND NEW GALVANIZING PROCEDURE MAKE POSSIBLE LOWEST UNIT COST.

Furnished in steel and aluminum—with flanged or plain ends.

Reinforced construction for heavy duty operations.

- **HUBBARD MAKES A COMPLETE LINE OF ALL STYLES OF FLANGES FOR USE WITH STEEL TRAVERSES.**



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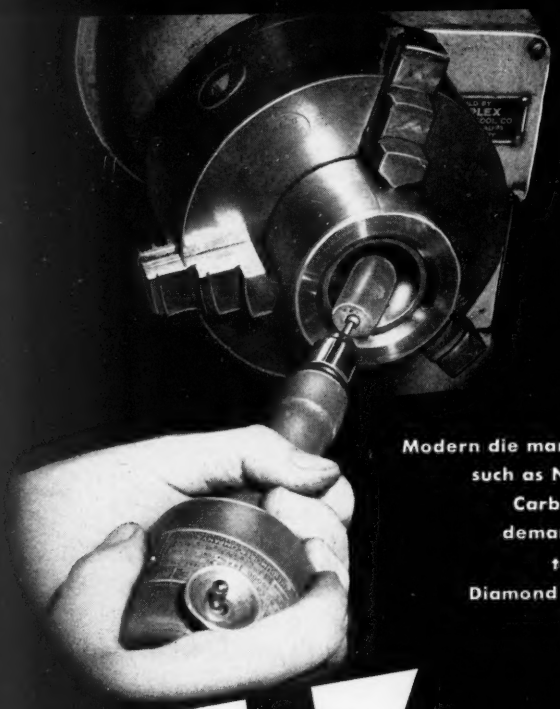
GARRETT (Tel.: Garrett 840) INDIANA

"THE BIGGEST NAME IN SPOOLS AND REELS"

flawless faster die finishing with scientific compounds



Modern die manufacturers such as New Jersey Carbide Die Co. demand Hyprez, the original Diamond Compound

HYPREZ

For economy of production and for finish to exact specification, New Jersey Carbide Die Co. uses Hyprez exclusively

High Precision DIAMOND COMPOUNDS

Serving many of the foremost plants in the wire industry, New Jersey Carbide Die Co., of Jersey City, uses Hyprez exclusively for rough finishing, lapping and polishing tungsten-carbide dies.

The continuing preference for Hyprez is built upon Hyprez superiority—maintained by research and control; by fast free-cutting action of pure diamonds precisely graded and uniformly dispersed in scientifically formulated vehicles. Hyprez provides the exact grade and concentration for every job.

Visit our Hyprez Exhibit, Space 124

Precision Hall, A.S.T.E. Exposition

HYPREZ DIVISION

ENGIS EQUIPMENT COMPANY, CHICAGO 5, ILL.

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Want to know the machinability characteristics of a stainless grade? Resistance to corrosion or scaling? Physical or mechanical properties? You can get the answers to these and other questions simply by setting the arrow on the Selector slide at the proper window. It's just as quick and easy as that.

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Start with the problem. For example, resistance to corrosion in contact with copper sulfate. Just set the slide at the proper index number shown on the Selector (in this case on the back), and you have the answer in a second – grades 302 and 316 are fully resistant to this form of attack.

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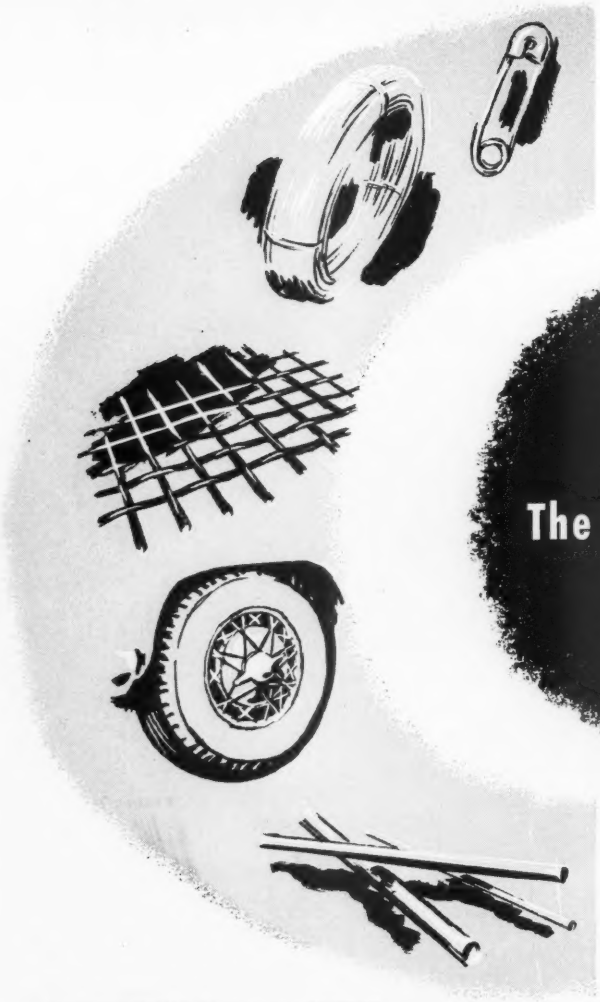
54 years of Fine steelmaking **STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • MAX-EL • ALLOY • SPECIAL PURPOSE STEELS



SWIFT'S SOAPS

The efficient lubricant for WIRE DRAWING!

In drawing wire . . . where production and profits depend on speed, a really efficient drawing lubricant is a key operator on your high production team. Actually, the greater your speed of production — the more you depend on the quality, the efficiency of your lubricants.

Swift's soaps are efficient and dependable because Swift's technical laboratories work consistently to maintain high product quality . . . to develop *better* soaps for industry. All of Swift's soaps are produced to meet rigid specifications from the finest raw materials obtainable.

FAST SERVICE

There is a Swift's soap distributor near you . . . 375 of them throughout the U. S. and Canada to provide you with quick delivery and resourceful service. So, next time you need a drawing lubricant, investigate Swift's soaps — see why they are so widely depended upon wherever tough wire drawing jobs call for *real efficiency.*

IMMEDIATE DELIVERY ON THESE QUALITY SOAPS . . .

- Powdered White Ribbon
- Guaranteed Powder
- Snap Heavy Duty Wire
- Drawing Powder No. 282
- No. 559 Powdered Soap

Call Swift for SOAPS

Another of Swift's Products for Industry

ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

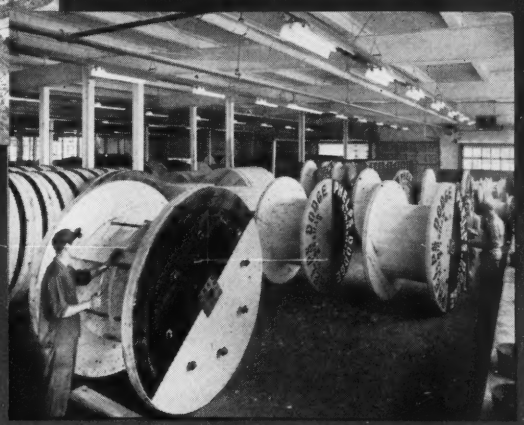
SWIFT & COMPANY
Industrial Soap Department
U. S. Yards, Chicago 9, Illinois

not just a stock, but . . .

ACRES of Lumber

GUARANTEES

PROMPT
REEL
DELIVERY



WOOD REELS
for
CABLE · ROPE · WIRE
made to your
SPECIFICATIONS

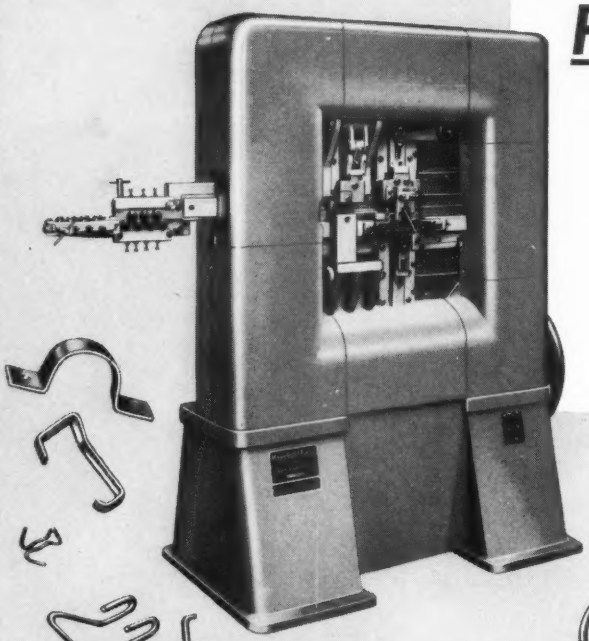
A large reserve of LUMBER plus BRIDGE'S unique PRODUCTION methods makes it possible to fill ORDERS without DELAY.

HIGH SPEED
SHIPPING SERVICE in our . . . OWN TRUCKS
within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels in 5 days or less east of the Mississippi.

BRIDGE
MANUFACTURING COMPANY
HAZARDVILLE, CONNECTICUT
Telephone . . .
Thompsonville, Connecticut
RIverview 9-8308

"REAL GOOD . . .
Let us quote on your reel needs. Send your specifications. Better yet, visit our plant and see how and why our reels are made so well at so low a cost.
WOOD REELS"

HOW VERSATILE CAN YOU GET?



P-L-E-N-T-Y... with MEYER, ROTH & PASTOR'S WIRE AND STRIP FORMING MACHINE

UNIVERSAL...
AUTOMATIC...
5 SLIDES, OR MORE...

MEYER, ROTH & PASTOR'S machines mass-produce these and many other parts.

- 5 different size machines for fully automatic, economical production of parts from wire coil or strip stock.
- Various sizes produce from 60 to 300 pieces per minute in wire up to .145" diameter or strips up to 25/32" wide.
- Simplified tooling—machine can be quickly re-set to produce different parts.
- Vertical design takes up little floor space.
- Positive and direct control of the bending slides insures high output and trouble-free operation.
- Roller straightening attachment (7 vertical and 7 horizontal rollers) can be opened—you can feed material without disturbing the roller setting.
- Special gripping device insures uniform feed and does not mark wires or strips.
- 3-speed drive.
- Standard equipment includes 4 forming and 1 punching slide and a complete set of tooling. Additional forming slides and attachments, including a blanking and punching attachment, can be supplied.

WRITE FOR BULLETIN

COSA CORPORATION
405 Lexington Ave., New York 17

Your source for all Precision Machine Tools—from Small Bench Lathes to Large Boring Mills

IN DETROIT AREA contact DETROIT-COSA CORPORATION, 16923 James Couzens Highway, Detroit 35, Mich.

USE "America's Finest Wire Drawing Lubricants"

MAY WE HELP YOU?

SERVICE CENTERS

ARTHUR J. O'MARA, c/o Standard Industrial Compounds Co., Millbury, Mass.

BRUCE SIEMON, 2400 Morrow Place, Pittsburgh 34, Pennsylvania.

CHARLES P. ORR, Caledonia Park, Fayetteville, Pennsylvania.

JOHN A. MORITZ, 719 St. Andrews Drive, Crete, Illinois.

ERIC RYLANDER, 4600 W. Ferdinand Street, Chicago 44, Illinois.

EARL BOWERS, 66 Dolphin Drive, St. Petersburg 6, Florida.

ARNOLD WEIGEL, 4600 W. Ferdinand Street, Chicago 44, Illinois.

wire drawing lubricants

Standard INDUSTRIAL COMPOUNDS CO., INC.

4600 WEST FERDINAND STREET
CHICAGO 44, ILLINOIS
Telephone: MAnsfield 6-9324-5-6

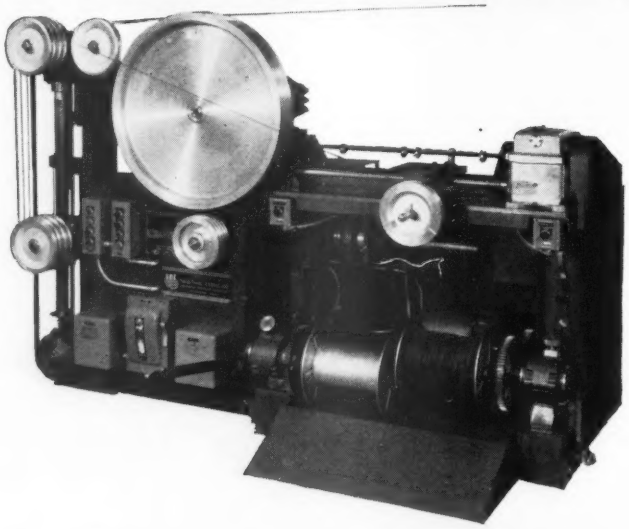
INTRODUCING

INDUSTRY'S NEWEST_____

MOST ADVANCED_____

MOST ECONOMICAL TOOL_____

Takeup Unit with Integral Capstan and Constant Tension Reel Drive



1st for UTILITY... Because of rugged construction, ease of control, plus high availability resulting from low maintenance requirements.

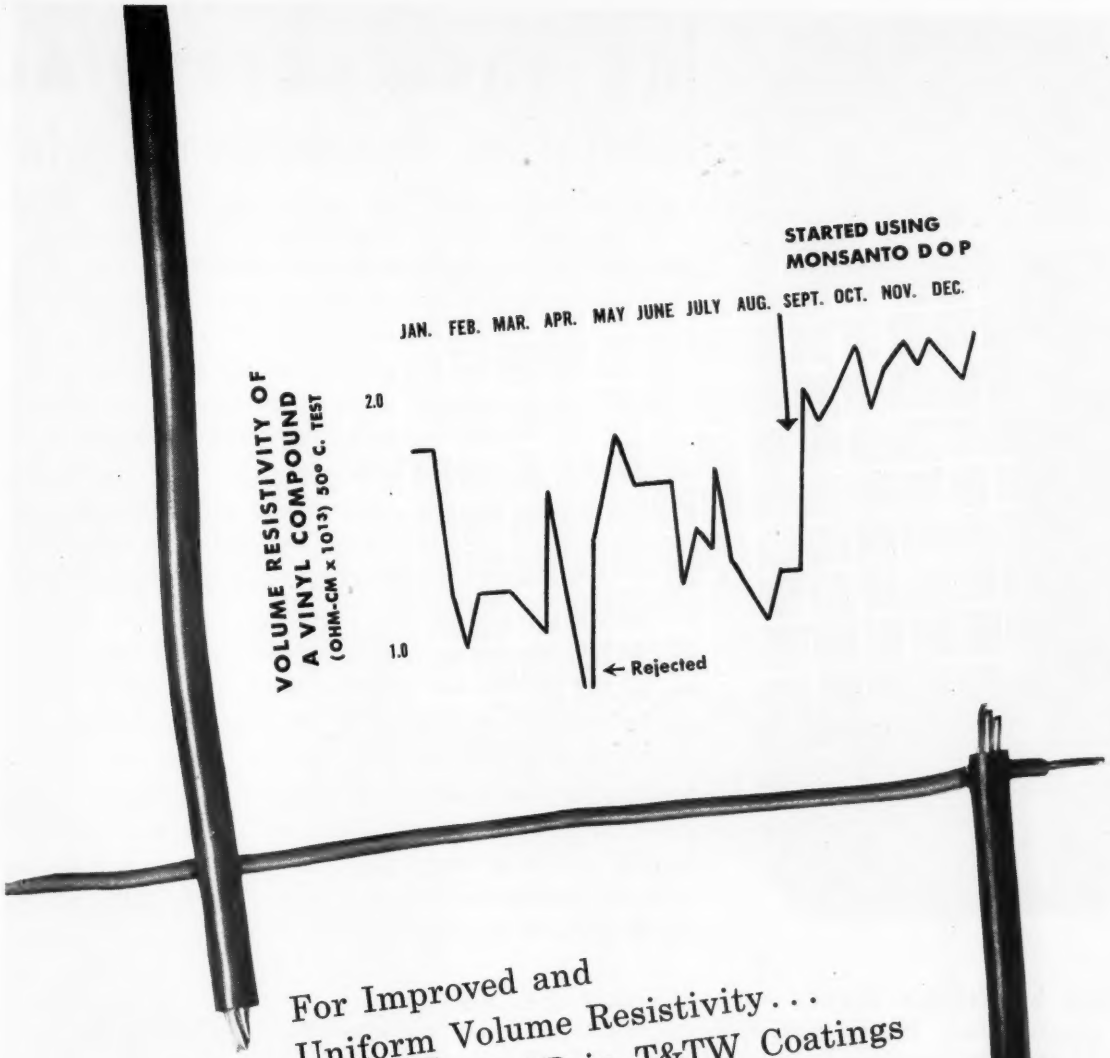
1st for DESIGN... Because of superior, exclusive features provided by IOI, it is self-contained—there is no need for other equipment for propelling or winding the wire or handling the reels.

Write or wire for an analysis of how you can profit by using IOI designed machines in your business today.

INDUSTRIAL IOI ENGINEERING VERSATILITY OVENS, INC.

13807 TRISKETT ROAD CLEVELAND 11, OHIO

IOI Builds Better Equipment



For Improved and Uniform Volume Resistivity . . . Use Monsanto DOP in T&TW Coatings

Monsanto DOP imparts consistently high quality electrical characteristics to vinyl wire and cable compounds.

The graph clearly shows how one manufacturer was able to increase the volume resistivity of his compound for T&TW household wire coatings by using Monsanto DOP. In addition, Monsanto DOP increased uniformity and was superior with red pigments which have the greatest degrading effect on electrical properties.

Evaluated in the compound — the place where it is most important — Monsanto DOP can't be topped for consistently high uniformity and quality. This manufacturer found that out by trying it. Why don't you?

For full information on how Monsanto plasticizers can help you, contact the nearest sales office or Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, P. O. Box 478, St. Louis 1, Missouri.

MONSANTO
CHEMICALS—PLASTICS

SERVING INDUSTRY . . .
WHICH SERVES MANKIND

NEW! HIGH POTENTIAL Insulation Breakdown Tester

• mobile • tests to 50,000 volts • capacities to 25KVA

RELIABLY DETECTS INSULATION FAILURES — The DAVIS Hi-Pot Tester cuts off high voltage at predetermined current flow. It automatically and positively identifies insulation breakdowns and prevents damage to tested equipment. For cable, wire and other insulation requiring ratings: 2 KVA 0-2,000 volts; 2 KVA 0-3,000 volts; 5 KVA 0-5,000 volts; 7½ KVA 0-7,000 volts; 15 KVA 0-15,000 volts.

PORTABLE — A handsome, streamlined, wrinkle-finished steel cabinet only 29" high, 23" wide, and 18" deep, houses this entire mobile tester which rolls quietly on puncture-proof rubber tires.

ECONOMICAL — A low center of gravity and large push-bar handle make a well balanced tester which can be easily moved wherever needed. Ideal for production budgets not permitting more than one unit.

SIMPLE TO OPERATE — Red light registers insulation breakdown. Green light indicates insulation O.K. Little or no maintenance over long usage. Ease of operation permits use of relatively unskilled help. Operates from 110 V, 220 V, 440 V, 50/60 cycles or any standard AC power line.

OFFERS MAXIMUM SAFETY — Designed to A.I.E.E. specifications, this ruggedly built DAVIS High Potential Insulation Tester provides laboratory testing accuracy for most industrial and railroad conditions. A magnetic safety switch breaks the circuit on breakdowns or overloads. The entire instrument case is maintained at ground potential. Test leads are heavily insulated and shielded to ground. Test probe handles are of thick dielectric strength material, with flash guards that prevent arc or flash burns and operator hand slippage.

BURN TESTS — Automatically creates a continuous arc at voltage and current sufficient to maintain the burn, thus precisely locating breakdown.

PLUS FEATURES — *Voltage control* is stepless continuously variable over complete output voltage range. *Voltage indicator* is easy to read, shows output voltage across test leads. Available in all standard and special KVA testers.

For full details, WRITE TO-DAY for Bulletin HPT.

Davis ELECTRIC CO.

WALLINGFORD, CONN., U.S.A.

DAVIS
WIRE & CABLE EQUIPMENT

HARNESS TESTERS ★ PAY-OFFS ★ TRAVERSES

SPARK TESTERS ★ SPOOLERS ★ TAKE-UPS ★ CAPSTANS

Correspondents throughout the world

Foreign Sales Representatives: OMNI PRODUCTS CORP. 460 — 4th Avenue, New York 16, New York

Nothing finer!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

You, too, *pay* for the best spring steel... make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

S.S. United States . . . most modern, fastest liner afloat.

ROEBLING CF&I

A subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

WHETHER YOU WALK, RIDE OR FLY...

BE SURE TO ATTEND THE

WORCESTER REGIONAL MEETING

April 22 and 23, 1954, Sheraton Hotel, Worcester, Mass.

The Program

Thursday, April 22nd

9:00 A.M.—Registration Desk Opens on Mezzanine Floor
10:30 A.M.—Directors' Meeting; 12:00 M.—Directors' Luncheon
2:00 to 5:00 P.M.—Technical Sessions

FERROUS SECTION—In Baroque Room

CHAIRMAN OF MEETING: Wade Hauk, General Superintendent, American Steel and Wire Div., U. S. Steel Corp., Worcester, Mass.

PAPER: "Manufacturer's Wire" by Rodman R. Tatnall, Field Service Metallurgist, Wickwire Spencer Div., Colorado Fuel & Iron Corp., Buffalo, N. Y.

PAPER: "Observations on the Effects of Pre-Plating Hot Galvanized Steel Wire" by Allan T. Baldwin, Chem. Eng., Hansen-Van Winkle-Munning Co.; Co-author: Henry H. Passolt, Chief Met., Johnson Steel & Wire Co., Worcester, Mass.

PAPER: "Practice and Control for the Manufacture of High Carbon Commodity Wires" by Robert H. Isenberg, Met. Eng., Pittsburgh Steel Co., Monessen, Pa.

NON-FERROUS SECTION—In Crystal Room

CHAIRMAN OF MEETING: Shaw Goldthwait, Quality Control Eng., Collyer Insulated Wire Co., Pawtucket, R. I.

PAPER: "Hypalon Chlorosulfonated Polyethylene, a New Material for the Wire and Cable Industry," by F. W. Keeley, E. I. du Pont de Nemours & Co., Wilmington, Del.

PAPER: "Opinion versus Facts in the Wire Industry," by A. U. Sternlof, Div. Product Eng., Quality Control, Electric Cable Div., American Steel & Wire Div., U. S. Steel Corp., Worcester, Mass.

PAPER: "Evaluation of Natural and Synthetic Rubbers for Insulated Cable" by Victor Siegfried, Chief Research Eng. of Electric Cable Div., American Steel & Wire Div., U. S. Steel Corp., Worcester, Mass.
Co-Author: W. G. Dahlstrom, Division Research Engineer, of the same company.

6:15-7:00 P.M.—Cocktail Hour, Open To All Who Register
7:00 P.M.—Banquet. After Dinner the Group Will be Addressed by a Speaker of Outstanding Reputation.

Friday, April 23rd

PLANT INSPECTION TOURS

8:30 A.M.—Busses leave for Ferrous Tour of both Wire and Rope Mills, Palmer Works, Wickwire Spencer Steel Div., Colorado Fuel and Iron Corp. Luncheon at Palmer, Mass.

9:00 A.M.—Busses leave for Non-Ferrous Plant Inspection Tour of The Cable Works of American Steel & Wire Div., U. S. Steel Corp., in Worcester. Luncheon will be served in Quinsigamond, Mass.

THE FEE: One charge of $8.00 will cover registration, the technical sessions, the banquet and bus transportation to and from the plants to be visited.
FOR THE LADIES: A special trip on Friday morning to Old Sturbridge Village has been arranged, details and cost of which may be secured at the Registration Desk. Ladies are also invited to attend the banquet on Thursday evening.

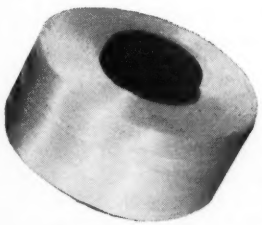
THIS WILL BE A GREAT MEETING—TRY TO BE WITH US!

THE WIRE ASSOCIATION

453 Main Street **RICHARD E. BROWN, Executive Secretary** **Stamford, Conn.**

L·O·F Fiber·Glass Yarns

now made for all electrical insulations



A complete series of continuous filament yarns—including 75-, 150-, 225-, 450- and 900-series yarns—now are offered the wire and cable industry by Libbey·Owens·Ford.

L·O·F yarns are made in a wide variety of single- and multiple-end packages. They can be used directly on standard types of magnet wire serving and wire covering machines, as well as on braiders, knitters and other conventional textile equipment. Waxed yarns are available, as well as special after-treatments.

Why not consult us on your electrical insulation needs. Our expanded production facilities insure delivery of your quality L·O·F Fiber·Glass yarns on schedule. Contact your nearest L·O·F office (offices in 26 major cities). Or write: Libbey·Owens·Ford Glass Company, Fiber·Glass Division, 2644 Wayne Building, Toledo 3, Ohio.

L·O·F GLASS Corrulux FIBER·GLASS

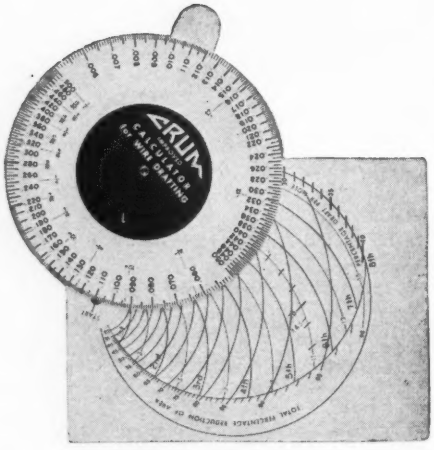
FIBER · GLASS

LIBBEY·OWENS·FORD GLASS COMPANY
FIBER·GLASS DIVISION

THE NEW and IMPROVED . . .

CRUM CALCULATOR

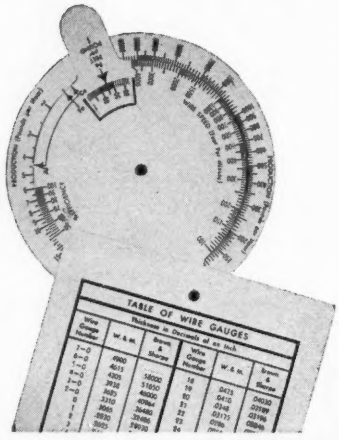
FOR WIRE DRAFTING



Front view of Crum Calculator.

THIS NEW DOUBLE-PURPOSE CALCULATOR WILL:

1. Provide quicker and more accurate information on die sizes and reduction areas;
2. Calculate wire production rates for various speeds and efficiencies.



Reverse view of Crum Calculator.

SOME OTHER FEATURES OF THE CALCULATOR

- Has new scale for more accurate determination of small percentages.
- Gives readings in B & S gauges.
- Intermediate lines provide reductions for 16 holes in one setting.
- New rectangular shaped back for better protection of calculator.
- More legible % draft-per-hole scale.
- Vinyl plastic construction, resistant to wear, warping, dirt, perspiration, wire drawing soaps—can be cleaned.
- Still fits your vest pocket.
- Handy tables of W & M and B & S gauges.
- Feet per pound calculating scale for steel, copper and aluminum wires.
- Durable, accurate, easy to use.

The improved Crum Calculator is worth its weight in gold in time saving —no laborious mathematical calculations necessary when you use it. Instruction sheet with examples accompany each Calculator. You should have one or more in your wire drawing department.

THE PRICE: $5.00 EACH

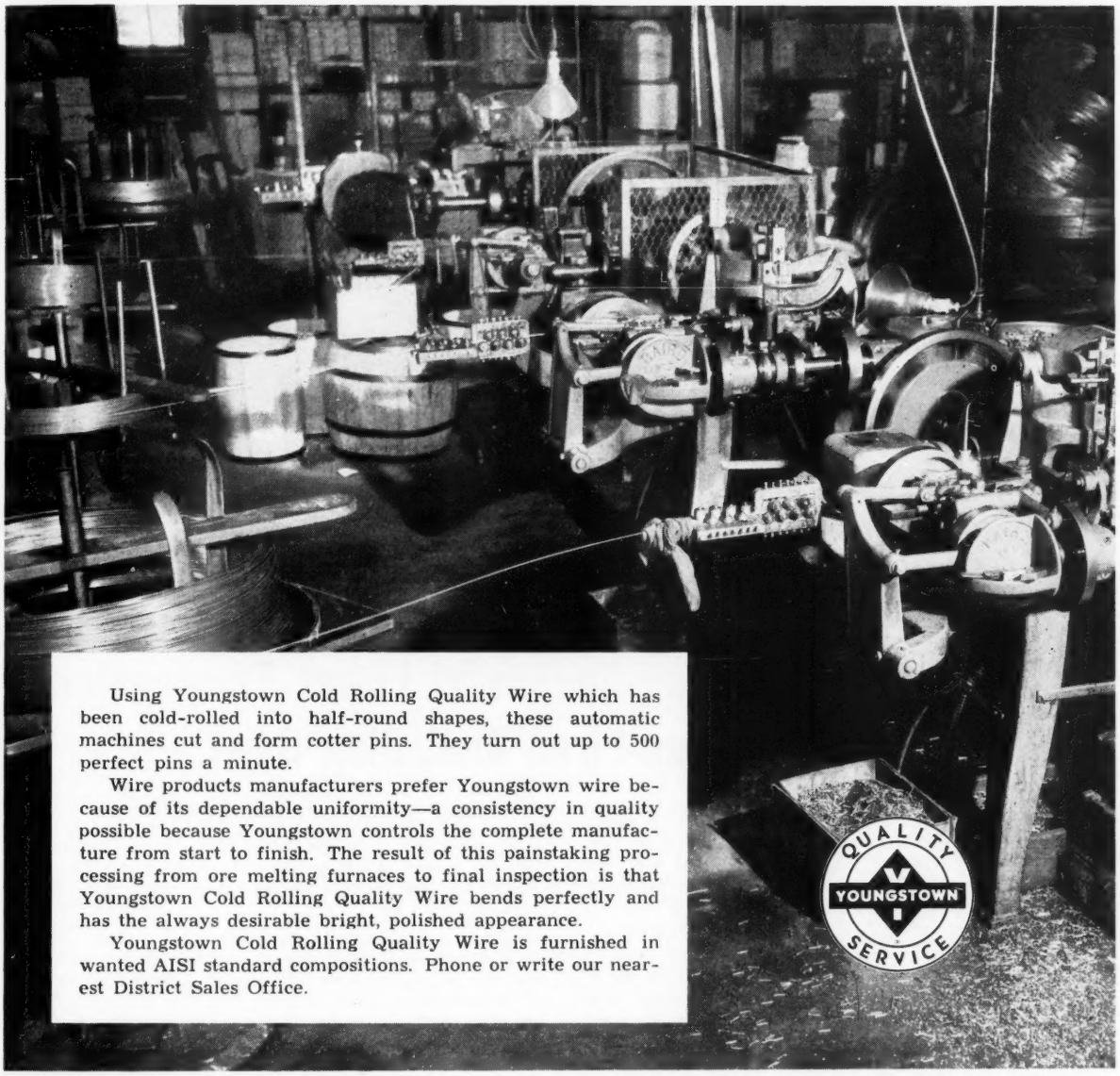
Send your orders to:

WIRE AND WIRE PRODUCTS

453 MAIN STREET **STAMFORD, CONN.**

(Exclusive distributors)

500 PERFECT COTTER PINS A MINUTE WITH PERFECT-BENDING YOUNGSTOWN WIRE



Using Youngstown Cold Rolling Quality Wire which has been cold-rolled into half-round shapes, these automatic machines cut and form cotter pins. They turn out up to 500 perfect pins a minute.

Wire products manufacturers prefer Youngstown wire because of its dependable uniformity—a consistency in quality possible because Youngstown controls the complete manufacture from start to finish. The result of this painstaking processing from ore melting furnaces to final inspection is that Youngstown Cold Rolling Quality Wire bends perfectly and has the always desirable bright, polished appearance.

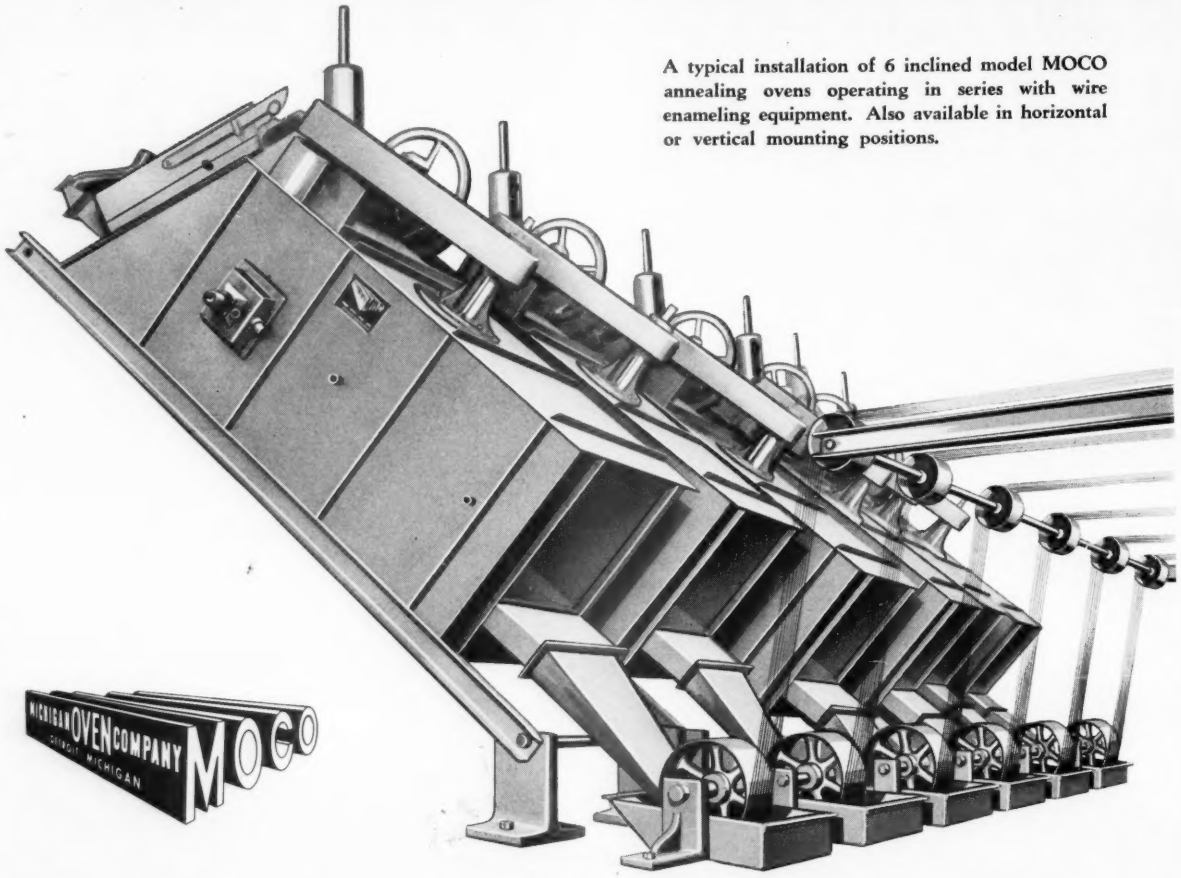
Youngstown Cold Rolling Quality Wire is furnished in wanted AISI standard compositions. Phone or write our nearest District Sales Office.

Youngstown COLD ROLLING QUALITY WIRE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES



A typical installation of 6 inclined model MOCO annealing ovens operating in series with wire enameling equipment. Also available in horizontal or vertical mounting positions.

NOW—Higher Operating Speeds at Lower Temperatures with New Gas-Fired Annealing Oven

Here is a new strand annealing oven with revolutionary design features which will eliminate or greatly reduce *any* annealing problem. Designed and engineered by the Michigan Oven Company, these ovens utilize advanced mixing and burning principals which exclude the need for troublesome external sources of steam or other inert atmospheres. Tried and proven in over 30 successful installations, these ovens are daily producing high quality wire at a greater range of speeds with less operating and maintenance costs.

HIGHER DEGREE OF ANNEAL *WITH LESS FUEL CONSUMPTION*

A greater degree of anneal is effected at low oven temperatures by the high heat transfer efficiency of MOCO's volumetric recirculation. Fuel consumption is amazingly low.

FUEL VERSATILITY AND HEAVY DUTY CONSTRUCTION

A wide variety of gas fuels may be used. Ovens can be switched to standby LPG fuels in a matter of seconds. The rugged welded construction offers you the greatest possible efficiency for years of continuous trouble-free operation. You'll be pleased at the reasonable price of these units. For complete information or an estimate on your needs—call in your MOCO representative or contact MOCO in Detroit today.

PRODUCERS OF COMPLETE ENAMELING SYSTEMS FOR ALL WIRE SIZES

- Glass, silicone, or textile varnish impregnating ovens.
- Tinning machine pay-off and take-up mechanisms.
- Organasol coating machines.
- Lacquer towers.
- Cloth treating ovens and equipments.

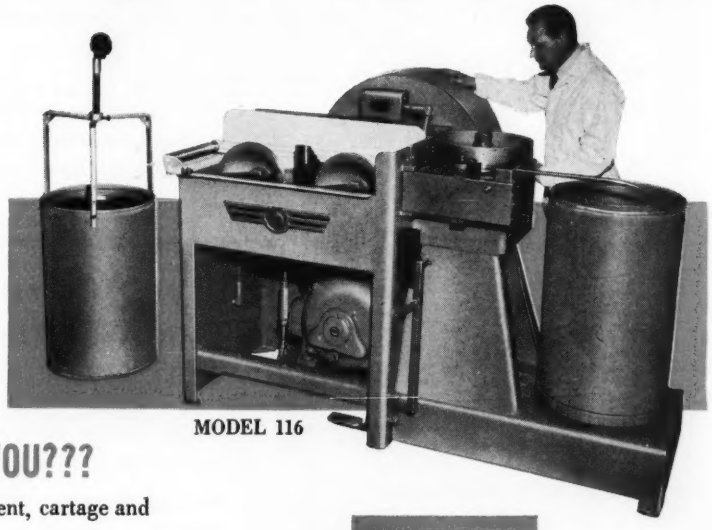
MICHIGAN OVEN COMPANY

425 BRAINARD
DETROIT 1, MICH.

*With the new COULTER & McKENZIE Continuous Wire Drawing and Packaging Machine

COMPLETELY EQUIPPED— IMMEDIATELY AVAILABLE

Model 116 is designed primarily for the specialty fine wire trade to draw and package wire *continuously* into an inexpensive PAYOFFPAK fibre drum. With this machine you can cash in *immediately* on the tremendous savings made through this revolutionary new principle.



MODEL 116

WHAT DOES THIS MEAN TO YOU???

Big Costs Eliminated

Cost of reel and spool investment, cartage and maintenance expenses.

Cost of tying, bundling, and packaging.

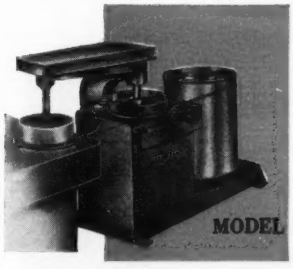
Cost of corrosion loss and scrap due to inefficient handling.

Big Savings Realized

Savings in greater weight more easily handled.

Savings in trouble free runs.

Savings through neater storage in larger packages.



MODEL 126

Model 116 is supplied ready for production; it requires only a wire-lead to the motor and stringing-up. The unit is furnished to meet your particular speed, horsepower, and die requirements.

CONTINUOUS WIRE PACKAGING ATTACHMENT

This unit can be custom fitted to your existing equipment. Write for our engineering questionnaire.

Other single purpose machines are available for finishing, trimming, take-up and packaging operations.

*Continental Can Company Licensee

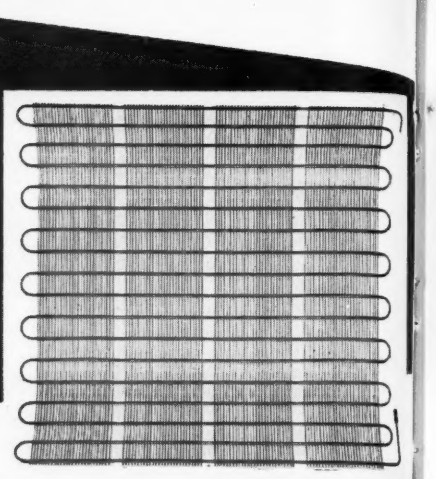
771 WATER STREET
OPPOSITE B.R. STATION

TELEPHONE 5-1161

THE COULTER & McKENZIE MACHINE CO., INC.
BRIDGEPORT 3, CONNECTICUT, U. S. A.

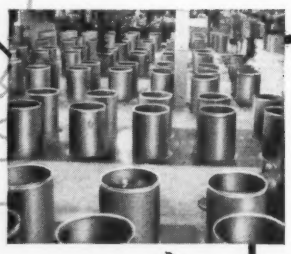
Now... Condensers can be Made with 216 Simultaneously Fed Strands of

CONTINENTAL® COIL WIRE



• By using Continental Coil Wire in exact specification, packed in the NEW Drum Container, 216 strands can be simultaneously fed into special high-speed welders to make condensers for the refrigerator trade. Such is the experience of the Seeger Refrigerator Company where Continental Wire specialists supplied not only the right wire, but also the right type of wire package—to do the job right.

Photos courtesy of the Seeger Refrigerator Company



OUT OF NEWLY DESIGNED DRUM CONTAINERS

INVESTIGATE THE ADVANTAGES OF CONTINENTAL'S NEW DRUM TYPE COIL WIRE PACKAGE

- 580 pound catchweight coils of single length wire in this new drum container are ideally suited for a continuous feed operation.
- New drum packaging has reduced customer's machine "down" time by as much as 30%.
- New drum package eliminates handling of bare coils of wire.
- No tie wires to contend with.
- Drums are ideally suited for storage—they stack well.
- Excellent protection against rust or surface corrosion—wire is clean and bright when used.
- Wire does not have to be oiled for protection—no messy and slippery storage area.

CONTINENTAL

STEEL CORPORATION • KOKOMO, INDIANA

PRODUCERS OF Manufacturer's Wire in many sizes, shapes tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

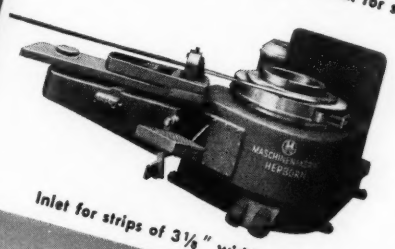
HERBORN

"HERBORN" Draw Blocks for single and double drafts.

Model VG with tapered draw block

Inlet wire dia. .708" max.

Model VG with special take-up block for strips

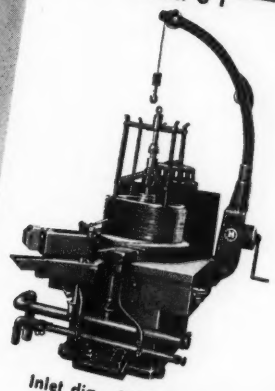


Inlet for strips of 3⅛" width max.

Model H G I—III

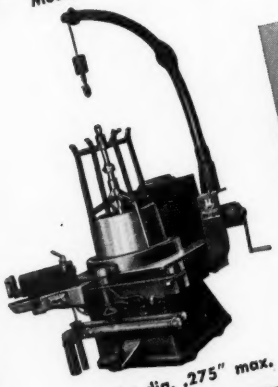
Inlet dia. .787" max.

Model G I



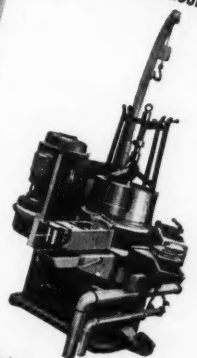
Inlet dia. .400" max.

Model G II



Inlet dia. .275" max.

Model G II with double-deck block



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The Wire Outlook

There has been much speculation as to whether business is heading for dangerously low levels.

Business leaders are generally optimistic, while much of the wishful-thinking pessimism stems from the political opponents of the Administration.

Steel mills have been operating at 65 to 70 percent of capacity and unemployment has risen to something over 3 million. Steel executives still hold to the belief that business will improve and some leaders look for an average of around 80% for the year.

While in some quarters the trend is still downward, it has improved elsewhere, with many indications that the turn to better business has started.

Wage rates are up, prices have pretty much stabilized, failures are few and far between, farmers are in a better position, government spending is down and the Department of Commerce has estimated that while the total of personal incomes is off, with the recent income tax reductions, there is slightly more disposable income available now for goods than at the close of 1953.

It is estimated for this year that 5 million cars will be sold, 6 million TV sets will find new owners, and, in general, that living standards will continue to rise. While factory employment has continued to dip. non-factory employment hit an all-time high in February, and building construction has gone into a seasonal pick-up. Retail sales in February increased and were only 5% under those of February 1953.

The encouraging factor in industrial and retail buying is that inventories have been worked off to rock bottom in most instances, so that buying has once again begun.

The key to good business is spending. This involves spending by industry for new plant and equipment, by wholesalers and retailers for stocks of goods and by the public for the things that they want. This last is most important and basic, as without it, factories cannot move their products. Competent observers assure us that the average consumer has not been frightened into hoarding, but will continue to satify his current needs.

Perhaps the best indication of the soundness of our future economy is the rate of population increase. Besides a return to civilian life of some 2 million Korean soldiers, the birth rate is continuing at a higher than normal rate, with new millions graduating into the wage earning-consumer class each year. All the plant expansion of the post-war era will not take care of the needs of our people by 1960.

By the first of this year our steel capacity had risen nearly 7 million tons over that of 1953 to a total of more than 124 million tons of ingots. If the industry operates at only 76% of capacity for 1954, the output will be the fourth highest in our history. Steel production ability has risen 47% since 1940.

Prompt wire shipments are the order of the day. This ability enables buyers to work close to requirements. The smaller mills who are able to fill small orders are finding business better than the big fellows who are geared to tonnage production.

Manufacturers wire is moving better and merchant wire is making its customary seasonal gains. A heavy demand for electric welded roadmesh has developed. In cold heading wire, which was slow in February, business is showing an up-swing. Some forward buying has been noted. One large producer of cold headed products in the Pittsburgh area anticipates first half sales of about 13% over last year. Automotive spring and cold heading wire buying, in spite of the high rate of production, is still below expectations.

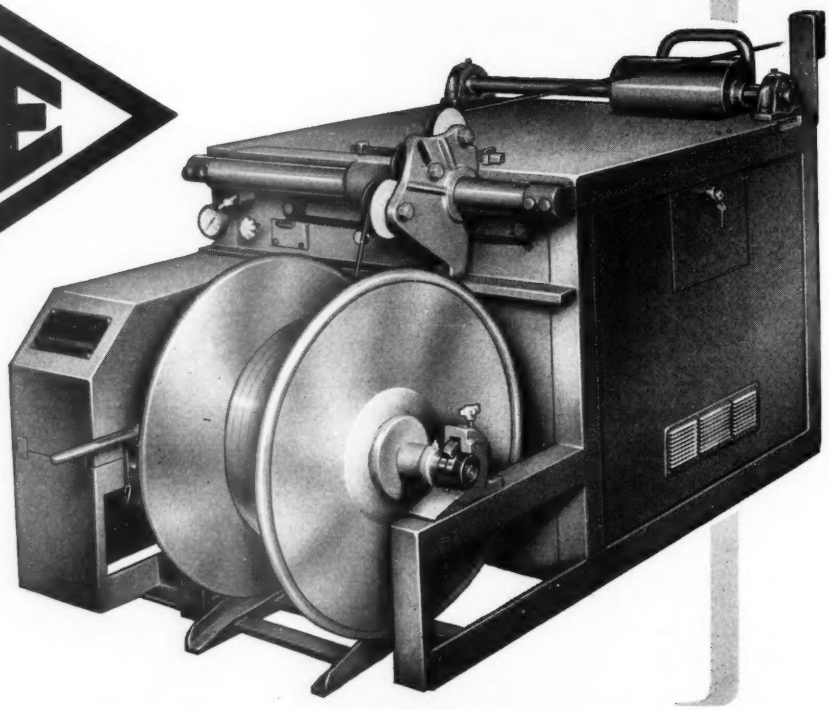
The wire situation may be summed up as spotty, but showing improvement, with much room for better business. What we have been going through is an adjustment from a war to a peace economy. As this progresses and business gets more out of the hands of the Federal Government and into commercial channels, the trend should show increasing betterment.

Certain it is that selling is highly competitive and hard-hitting sales tactics, plus intelligent and conscientious service, are now necessary to make the wheels turn.

—from the Editor's Desk

INDIVIDUAL DRIVE– BRAKE–and–TRAVERSE

RE-SPOOLERS



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Vol. 29 APRIL, 1954 No. 4

The Economy of Shaped Wire

by Emmett H. Mann
Sales Manager
Alloy Metal Wire Company, Inc.
Prospect Park, Pa.

In this article the author notes the economic advantages of using shaped wire in many fabricating operations and describes the manner in which shaped wires are made.

Mr. Mann, a graduate in Metallurgical Engineering of Rensselaer Polytechnic Institute, joined Alloy Metal Wire Company in 1949 and was made Sales Manager in December, 1953. Prior to this he worked for General Electric as a metallurgical engineer, being concerned with high nickel, copper and chromium alloys.

Shaped Wire Saves Time and Money

More and more manufacturers today are discovering the unusual economies that are derived from the use of shaped wire in the manufacture of metal products and equipment. In addition to reducing manufacturing costs of existing product designs, the almost limitless applications of shaped wire make possible the manufacture of new products that might otherwise be impractical because of prohibitive costs.

Production Economies with Shaped Wire

The use of shaped wire eliminates costly machine operations which would otherwise be necessary in the fabrication of the finished product, while providing precision dimensions, shape and finish to meet specific requirements. Wire, rod and strip can now be drawn and rolled to pre-determined shape in a wide variety of alloys including monel, inconel, nickel and various grades of stainless steel. Special rolling mills, turks heads and wire and rod drawing blocks make it possible to produce shapes such as those shown in Figure 1 to very close tolerances. These and other shapes are readily supplied in coil or straightened and cuts lengths as the manufacturer requires.

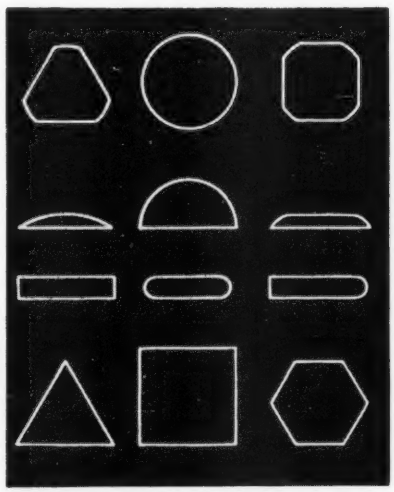

Figure 1—A few of the special shapes made in various sizes and alloys. * * * * * * * * *

* * *

While some special shapes may require special forming dies, the cost of the die is negligible compared to the direct saving in machine time and costs made possible with pre-shaped wire. At the same time, because it is work-formed rather than machined, shaped wire often exhibits better metal characteristics which, in turn, contribute to improved product. Wire being drawn through such a die is shown in Figure 2.

* * *

Even where quantity requirements do not justify die costs, the use of the turks head machine permits the rolling of many shapes

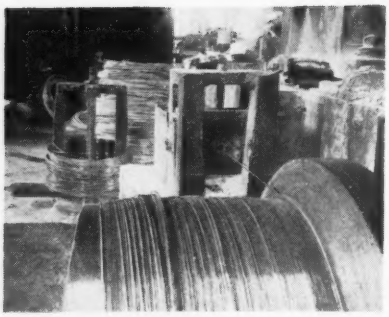

Figure 2—Shaped wire being drawn. The coil in the foreground contains shaped wire ready for use, except for final cleaning and annealing, if required for the customers' use. The wire here is used in the manufacture of well point screen.

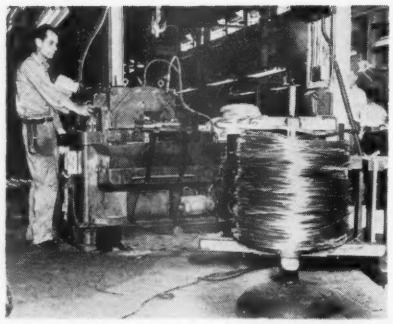

Figure 3—The turks head machine in operation.

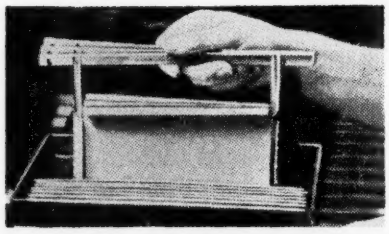

Figure 5—Film racks made of lightweight, chemical resistant stainless steel flat wire. * * * *

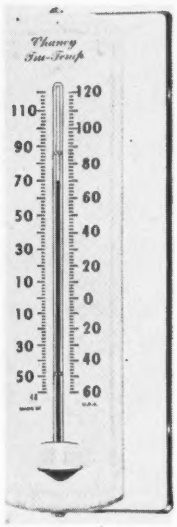

Figure 4—Outdoor thermometer of precision rolled stainless steel strip. * * * * * * * * * * * *

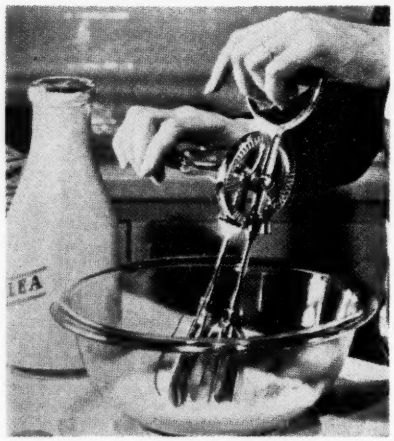

Figure 6—Egg beaters of stainless steel flat wire operate smoothly, are easy to clean and have good sales appeal. * * * * * * * * * * * *

without special forming dies. With this unique machine, wire is drawn from coils and passed between two sets of double rollers in each of two heads in the machine. In each head the wire is further reduced and rolled to the desired shape. Figure 3 shows a turks head machine in operation in our plant.

Applications of Shaped Wire

Figures 4, 5, 6, and 7 show typical uses of shaped wire in the manufacture of products for both industry and the home. For these applications, Almet Stainless Steel flat wire, strip and special shapes were utilized. Limitations on stainless steel precision rolled flat wire are given in Table 1.

Well Point Screen

An unusual application of shaped wire is found in the design and manufacture of well point screens. In the Johnson Well Point Screen shown in Figure 8, corrosion resistant stainless steel shaped wire and rod are utilized to produce the necessary tensile strength, intake capacity and durability of the screen. Wire of various compositions is used to meet the corrosion resistance requirements of each individual well installation.

★ ★ ★

The shapes of the outside wrapping wire and vertical rod members of this screening, shown in Figure 9, were designed to permit a maximum flow of water by means of a continuous slot open-

(*Please turn to page* 454)

TABLE I

FLAT WIRE AND STRIP LIMITATIONS

Thickness	Width	Edge	Temper	Package Form	Straight Lengths	Grades
0.001" min.	1/64" max.	Natural Round	All Tempers	Spools Only	No	All Grades
*0.002" min.	1/32" max.	Natural Round	All Tempers	Spools Only	No	All Grades
*0.003" min.	1/16" max.	Natural Round	All Tempers	Spools Only	No	All Grades
*0.005" min.	3/32"-1/8"	Natural Round	All Tempers	Spools or Coils (1)	No	All Grades
*0.005"-0.020"	1/8"-3/8"	Natural Round or Slit Edge (depends on size)	All Tempers except partial limitation on thin strip.	Spools or Coils (1)	No--except sizes over ¼" wide and over 0.015" thick.	All Grades
0.020"-3/16"	1/8"-3/8"	Rolled Round or Square Edge.	All Tempers	Coils or Spools (1)	Yes--All Sizes	All Grades
0.025"-0.062"	3/8"-1"	Rolled or Slit Edge (depends on size)	All Tempers (2)	Coils	Yes--All Sizes	302-304-420 Only
All thicknesses up to 0.040" max.	1½" max.	Slit--if not listed above.	All Tempers (2) except as follows: 0.005-0.010,max.¼" hard 0.010-0.015,max.⅜" hard 0.015-0.020,max.3/4"hard	Coils	Yes--in Thickness over 0.015"	302-304-420 Only

*Square rolled edge can be furnished in limited range of sizes if they are produced on turks head in which case coils or spools can be furnished.
(1)Size will determine use of spools or coils.
(2)Type 420 is furnished only in the annealed or as roller temper, not heat treated.

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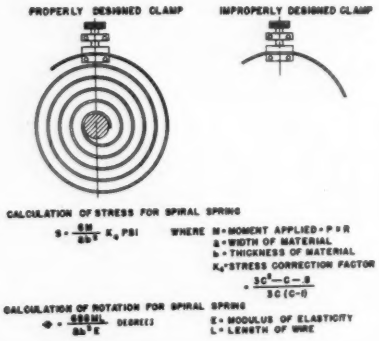
Discussion on Precision Spring Design

by M. Gerard Fangemann
General Manager
John Chatillon and Sons
New York, New York

Part III

This dissertation on spring design was delivered by the author at a meeting of American Society of Mechanical Engineers in New York on October 6th. It contains the results of much research work and treats of many design aspects on which material has not previously been published. Due to its length it will be published in three parts, of which this is Part III.

While we are on the discussion of torsion springs, let us discuss spiral springs as well as hair springs, since these are forms of torsion springs. Unfortunately very little information is published with regard to spiral springs,


PROPERLY DESIGNED CLAMP
IMPROPERLY DESIGNED CLAMP
CALCULATION OF STRESS FOR SPIRAL SPRING
WHERE M = MOMENT APPLIED = P × R
a = WIDTH OF MATERIAL
b = THICKNESS OF MATERIAL
K4 = STRESS CORRECTION FACTOR
CALCULATION OF ROTATION FOR SPIRAL SPRING
DEGREES
E = MODULUS OF ELASTICITY
L = LENGTH OF WIRE

which are definitely becoming more and more important in industry today. A spiral spring is usually one manufactured of flat wire mounted on a hub or collet, and accurately calibrated to torque requirements. The type of spring material used for this type of spring is determined by the application and factors such as electrical resistance, corrosion resistance uniformity in rate with changes in temperature, and space limitations. Hysteresis and drift requirements also constitute an important factor in determining the spring material.

★ ★ ★

The formulas for stress and deflection of spiral springs are the same as for torsion springs of rectangular cross section, namely:

$$S = \frac{6M}{ab^2} K_4$$

$$\theta = \frac{688\ ML}{ab^3E}\ \text{Degrees}$$

★ ★ ★

These formulas are used when there are many turns without contact and the outer end of the spring is clamped as is the usual case. In fact, these formulas can be used for springs having as few as two turns and a ratio of moment arm of inner end divided by moment arm of outer end between 4 and 6 without introducing serious error.

★ ★ ★

For instruments requiring good straight-line characteristics between torque and deflection it is imperative that none of the coils touch throughout the complete rotation of the spring from initial torque to final torque. It is the spring designer's job to design spiral springs with the maximum length of wire possible for this type of spring, to insure best results. For example, here is an illustration of a spiral spring that is improperly designed and is made approximately 10 times larger than the original spring, for illustrative purposes. If we were to place this spring on a shaft and clamp the outer ends at the point of calibration for torque and wind the spring two full turns, you will note that the spring tends to cock over to one side and eventually a certain number of the outer turns actually touch each other. When this condition occurs the rate actually will change, since friction between coils will increase the torque value. This spring obviously does not have enough material and too much bending takes place for a desired rotation. If, however, this spring contained the correct length of wire, such as in this second example, you will note that all coils are free when the spring is wound two complete turns. By having the maximum length of wire in a spring with the lowest possible stress, the best possible straight-line characteristics will be obtained, as well as the lowest drift and hysteresis errors.

★ ★ ★

The type of inside end or the type of hub used on spiral springs is purely dependent upon the application. Usually it is desirous to have a hub wherever possible, since the spring can then be soldered quite readily to the hub or silverbrazed if necessary. The design of the clamp for the outer end of spiral springs is quite important, and a typical clamp is illustrated on our demonstration board. You will note that the clamp is composed of two halves, the spring being inserted between these halves and having the approximate radius of the outer coil at the point of calibration. If the clamp were composed of two flat pieces, then the spring would be flattened upon being calibrated and although this is not objectionable, it would cause difficulty if slight changes in calibration were necessary after assembly in the unit. Spiral springs

can be designed to have as much rotation as 720 degrees if necessary, but further rotation would be impractical, since buckling would occur. It is not recommended to design spiral springs for more than 720 degrees of rotation.

★ ★ ★

Beryllium Copper is the foremost material used for the vast majority of spiral springs. However, here again industry is constantly improving its products, and greater accuracy of the springs is required. Consequently the use of temperature-compensated materials for spiral and hair springs is rapidly becoming very important. We might mention that spiral springs made of heat treatable materials such as Beryllium Copper can be manufactured to very close tolerances on physical dimensions. Springs made from other alloys, however, such as Stainless Steel or Iso-Elastic, must have broader tolerances on all physical dimensions, since the springs are coiled from material already in the hardened state.

★ ★ ★

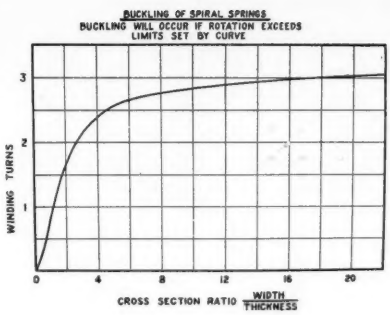
Extreme care must be taken in designing springs from this type of specialized spring material, since the space between coils will not be uniform as in springs made from heat-treatable alloys. Actually, the space between coils increases uniformly for each successive coil when non-hardenable alloys are used.

★ ★ ★

Regarding spiral springs, we might mention that buckling will occur with this type of spring if the design is not correct. Oddly enough, buckling is not dependent on the length of wire in the spring or the number of coils or on the dimensions of the spring. The only determining factor in a spiral spring is the ratio of cross-sectional dimensions, the width b and thickness a.

★ ★ ★

We have taken the liberty of reproducing a curve developed by J. A. Haringx and published in the text "Instability of Springs" and this curve is shown herewith. You will note that the



number of turns is plotted against the cross-section ratio b/a, and the importance of this ratio practically disappears when the value is ten or more. The curve nearly approaches a horizontal line beyond 10 and the number of turns wherein buckling would occur is approximately 3.

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A copy of this chart will also be included with our data sheets.

★ ★ ★

While we are on the subject of spiral springs it might be well to discuss also hair springs. Very little has been published concerning the design of these springs. These springs, as you know, are used in many familiar types of instrumentation, ranging from the mechanical timepieces to precise electrical measuring equipment. There is usually no question concerning safe stresses for the design of this type of spring, since hairsprings are invariably designed at low stresses. The material used for a particular application is determined by factors including electrical conductivity, corrosion resistance, magnetic characteristics, and of course, minimum drift and hysteresis errors.

★ ★ ★

Hair springs in the past have usually been manufactured of Beryllium Copper. This material has excellent drift and hysteresis characteristics, and most important of all, the material is heat-treatable and can be coiled in the formed state and heat-treated, after which it retains the exact shape of the die. Springs manufactured in this manner can be held to extremely close tolerances on physical dimensions and all coils will be uniformly spaced. As in the case of spiral springs, the width and thickness of the material are determined by the torque requirements and space limitations. Hair springs are usually mounted on small collets and these collets are produced in various shapes and sizes. The equations for calculating hair springs are identical with those of spiral springs previously discussed.

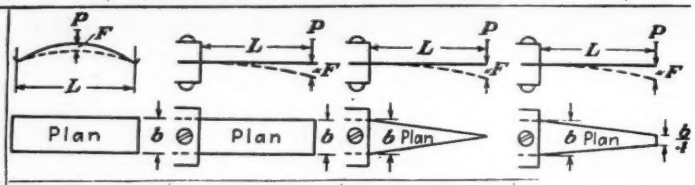
★ ★ ★

Lately it has been found necessary to use materials other than Beryllium Copper because greater accuracy is required by industry today. Today it has become necessary to convert many springs making use of Beryllium Copper to a temperature-compensated alloy. This change was necessitated because of instrument improvements whereby the errors produced by changing spring rates resulting from changes in temperature affected the actual accuracy of the instruments. This has caused a very serious problem for the spring manufacturer, since great difficulty is encountered in coiling springs of temperature-compensated materials having uniform space between coils. The springs have to be coiled of materials already in the hardened state, and variations in straightness and in cast have a pronounced effect during the coiling operation.

★ ★ ★

So far we have discussed four types of springs, namely, extension, compression, torsion and spiral springs, and we now come to the fifth and final type of spring, namely, form springs. There are many classifications of form springs and the main classification is cantilever-type springs having various shapes. Flat springs are usually supported at one end, the load being applied at the opposite end, wherein deflection occurs. The same equation for calculating the stress is used, as discussed earlier for beams, which is $S = \frac{Mc}{I}$ where S = stress, and c = distance from the neutral axis to the outside fiber, or half the thickness, I equals the moment of inertia, which is equal to $\frac{bt^3}{12}$ for rectan-

TABLE 110-16.—FORMULAS FOR FLAT SPRINGS*
(Based upon standard beam formulas where the deflection is small)

Property				
				
Deflection, in. f	$\frac{PL^3}{4Ebt^3}$ (35)	$\frac{4PL^3}{Ebt^3}$ (35a)	$\frac{6PL^3}{Ebt^3}$ (35b)	$\frac{5.22PL^3}{Ebt^3}$ (35c)
	$\frac{S_bL^2}{6Et}$ (35d)	$\frac{2S_bL^2}{3Et}$ (35e)	$\frac{S_bL^2}{Et}$ (35f)	$\frac{0.87S_bL^2}{Et}$ (35g)
Load, lb. P	$\frac{2Sbt^2}{3L}$ (36)	$\frac{Sbt^2}{6L}$ (36a)	$\frac{Sbt^2}{6L}$ (36b)	$\frac{Sbt^2}{6L}$ (36c)
	$\frac{4Ebt^3F}{L^3}$ (36d)	$\frac{Ebt^3F}{4L^3}$ (36e)	$\frac{Ebt^3F}{6L^3}$ (36f)	$\frac{Ebt^3F}{5.22L^3}$ (36g)
Bending stress, psi S_b	$\frac{3PL}{2bt^2}$ (37)	$\frac{6PL}{bt^2}$ (37a)	$\frac{6PL}{bt^2}$ (37b)	$\frac{6PL}{bt^2}$ (37c)
	$\frac{6EtF}{L^2}$ (37d)	$\frac{3EtF}{2L^2}$ (37e)	$\frac{EtF}{L^2}$ (37f)	$\frac{EtF}{0.87L^2}$ (37g)
Thickness, in. t	$\frac{S_bL^2}{6EF}$ (38)	$\frac{2S_bL^2}{3EF}$ (38a)	$\frac{S_bL^2}{EF}$ (38b)	$\frac{0.87S_bL^2}{EF}$ (38c)
	$\sqrt[3]{\frac{PL^3}{4EbF}}$ (38d)	$\sqrt[3]{\frac{4PL^3}{EbF}}$ (38e)	$\sqrt[3]{\frac{6PL^3}{EbF}}$ (38f)	$\sqrt[3]{\frac{5.22PL^3}{EbF}}$ (38g)

* Numbers in parentheses are formula numbers.

gular sections, where b equals the width of material and t equals the thickness. M equals the moment, which in turn equals the applied load times the length of the beam. With proper substitution the formula for stress becomes

$S=\frac{6\,PL}{bt^2}$ for rectangular section cantilever beams.

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The equation for deflection of a cantilever beam with a load at its free end is $F=\frac{PL^3}{3EI}$ where F=the deflection in inches resulting from the applied load P in pounds and E equals the modulus of elasticity. The moment of inertia in this case, as before, would equal $\frac{bt^3}{12}$. With proper substitution the basic equation becomes: $F=\frac{4\,PL^3}{Ebt^3}$ for rectangular sections.

★ ★ ★

It is quite important to have properly designed clamps for supporting cantilever type springs, and it is preferable to have the clamp edges rounded to eliminate the stress concentrations. There are numerous illustrations of the shapes of this cantilever type beam given on our screen, which shows the calculations for stress and deflection for the various shapes involved. This chart was taken from the Tool Engineers' Handbook, published by the A.S.T.E. We might mention that an excellent reference on springs and spring materials is contained in this publication, which was written by H. R. Carlson. Now, this chart shows four different types of flat springs, and we are including this with other data that will soon be presented to you.

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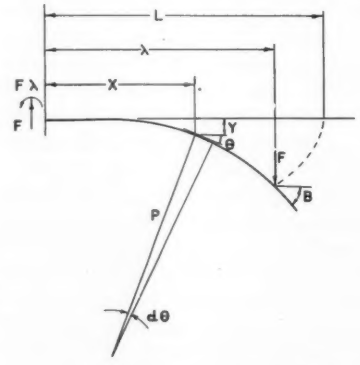
We might point out that these equations presented are for small deflections only, and if the deflections are large, the stress and deflection equations will not hold true. For large deflections we refer to a recent article in Machine Design of July, 1953, by J. H. Baltrukonis, in which he derives the proper equations for cantilever springs having large deflections. Baltrukonis' treatment of the problem is particularly noteworthy. While his solution for the deflection of any point on a cantilever beam involves the evaluation of elliptic integrals, he constructed a set of curves which provide rapid answers. All the curves involve what is called a characteristic parameter ql, where a $q=\frac{F}{EI}(1-v^2)$, in which F = load, v is Poisson's ratio, and l equals the length of beam before deflection.



CO-ORDINATE SYSTEM AND NOMEMENCLATURE FOR A THIN CANTILEVER BEAM

CANTILEVER SPRING WITH LARGE DEFLECTION

CHARACTERISTIC PARAMETER = ql WHERE $q=\sqrt{\frac{F}{EI}(1-\nu^2)}$

F = LOAD

ν = POISSON'S RATIO

$\frac{y_{max}}{l}=C_1$ or $y_{max}=C_1 l$ } WHERE C_1 IS READ FROM FIG. 1.

$\frac{y}{l}=C_2$ or $y=C_2 l$ } WHERE C_2 IS READ FROM FIG. 2.

$\sigma_{max}=\frac{Flh\sqrt{2\sin\beta}}{2Iql}$ WHERE σ_{max} = ACTUAL MAXIMUM STRESS
h = THICKNESS OF CROSS-SECTION
β = ANGLE AT END OF BEAM

$S_{max}=\frac{Flh}{2I}$

$\frac{\sigma_{max}}{S_{max}}=C_3$ or $\sigma_{max}=C_3 S_{max}=\frac{C_3 Flh}{2I}$ } WHERE C_3 IS READ FROM FIG. 3

We realize that the procedure developed by Baltrukonis is not going to be wholly absorbed in the few minutes' time allotted for cantilever springs. Consequently we have worked out an illustrative problem that will be included also with other data, but we believe it worthwhile to actually go through

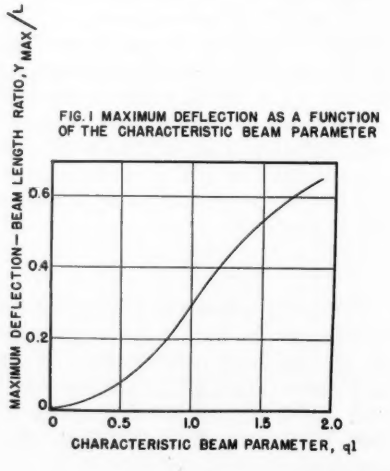


FIG. 1 MAXIMUM DEFLECTION AS A FUNCTION OF THE CHARACTERISTIC BEAM PARAMETER

the procedure as outlined.

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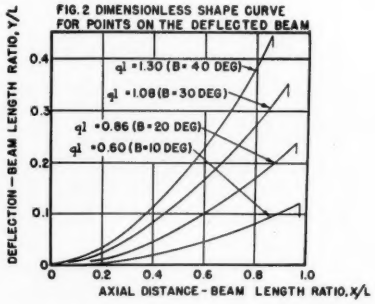
When the dimensions and material of the beam and the load is known, the parameter ql can be calculated from this equation. To find the deflection at the end of the beam refer to the curve in Fig. 1, which is a plot of the ratio $\frac{Y\ max.}{L}$ vs. ql. Here Y max. is the deflection at the end of the beam. Now, knowing the value of ql, just calculated, we use this curve to find the corresponding value of $\frac{Y\ max.}{L}$. Let this value be C_1, or where $\frac{Y\ max.}{L} = C_1 L =$ Deflection at end of beam.

★ ★ ★

If the deflection is wanted for any other point located at a distance X from the clamped end of the beam, the curves of Fig. 2 are used. First calculate the value of the ratio $\frac{X}{L}$. Using this and the value of ql, refer to the curves in Fig. 2 for the corresponding value of the ratio $\frac{Y}{L}$, which we call C_2

$$\text{or } \frac{Y}{L} = C_2$$

where $Y = C_2 L =$ Deflection at a point at a distance X from clamped end.



The expression for maximum stress is given as

$$\frac{\text{max.} = Flh\sqrt{2\sin B}}{2I_q 1}$$

where h = thickness of cross-section of beam

B = Angle at end of beam when loaded and measured from the horizontal.

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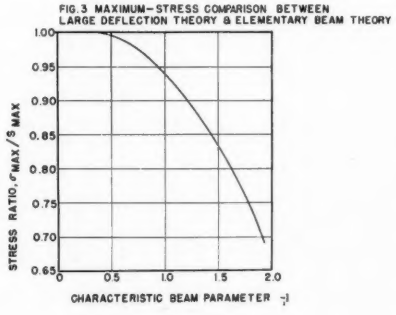
To solve this equation requires the value B. Here again, it would require the solution of elliptic integrals but instead the curve of Fig. 3 is used. This curve is a plot of the ratio $\frac{8\ max.}{S_{max.}}$ v.s. ql, the parameter.



$S_{max.}$ is the maximum loading stress in a beam as calculated from the usual beam formula. For a cantilever beam $S\ max. = \frac{FLh}{21}$. From Fig. 3 for the value ql, previously calculated, we find the corresponding value of the ratio $\frac{8\ max.}{S\ max.}$ which we'll call C_3, or

$$\frac{\text{max.}}{S\ max.} = C_3$$

$$\text{or max.} = C_3 S\ max. = \frac{C_3 FLh}{2I}$$

equals maximum stress at X = o

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This method of calculating the stress and deflection of beams with large deflections is certainly a practical one. It might be noted that the curves provided can be used where the angle at the end of the beam can be as large as 40° from the horizontal. If the usual beam formulas were used on such springs there would be a considerable error introduced. Of course, if a greater degree of precision is required than would be obtained by reading from curves, the exact values of stress and deflection can be calculated but it would take considerably longer. An illustrative problem has been worked out using the aforementioned equations, and we will distribute these shortly.

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This concludes this formal discussion on precision springs. We have endeavored to present basic information on the proper design of the 5 main types of springs. Along with this basic design information we have included other important characteristics of these various types of springs which we thought would be of interest to this Engineering group. At the same time, specialized information was presented, such as the proper design of calibrators for extension and compression springs, which we believe will find ever-increasing importance for industrial applications in future years. Throughout our discussion we have constantly mentioned the various design procedure sheets, and illustrative problems will be presented to you at the conclusion of this discussion. This information was carefully selected and prepared, and we trust that you will be able to make good use of it, a good part of which has not been published previously.

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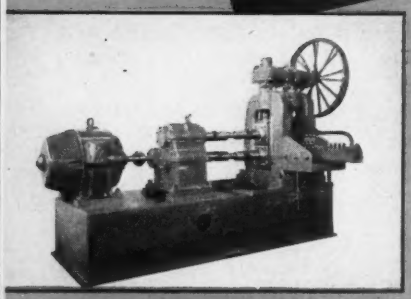
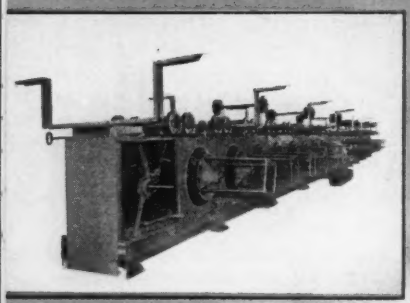
LOOK TO Wean FOR WIRE MACHINERY

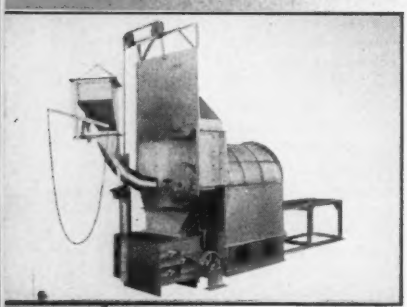
Process OR Product



2—Hi Wire Flattening Mill



Wire Galvanizing Take-Up Frame

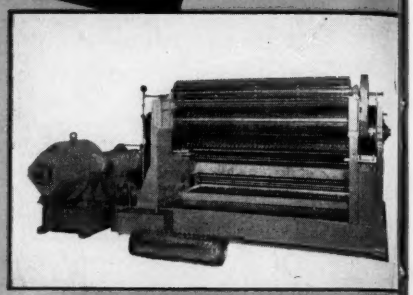


Nail Galvanizing Unit

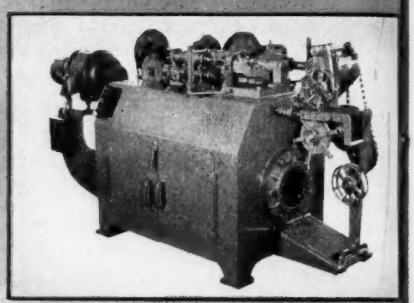
In the past few years tremendous progress has been experienced in the field of wire machinery. Production speeds have been tripled and quadrupled. Product quality has been greatly improved. Machines have been made easier to operate and maintain.

The Wean Equipment Corporation has been a large contributor to this advancement. Wean wire mill specialists have designed, built, and installed wire mill equipment for the leading wire producers the world over. If you make wire you should look to Wean for the best in machinery, service, and facilities.

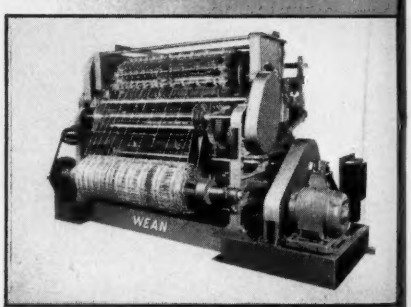
STRIP MACHINERY



Hexagon Netting Machine



2 or 4—Point Barbed Wire Machine



Hinge — Joint Fence Machine

Wean Equipment Corporation
CLEVELAND, OHIO

Annealing and Patenting with Salt Baths

by L. B. Rousseau
Vice President
Ajax Electric Furnace Company
Philadelphia, Pa.

In this article the author has emphasized two points—the improvements in salt bath furnaces that have increased their utility and the variety of applications for which they are suited in the wire industry.

Heat treatment of wire and wire products by means of salt bath furnaces has become to be highly efficient and of great economic import during the last few years. Through continuous improvements in the design and materials of furnaces, and a program of education in their proper utilization, salt baths are now operating with high utility and satisfaction in wire processing. Salt bath heating has several inherent advantages that contribute to their growing popularity. For example, with a salt bath, no atmosphere problem exists simply because all "atmosphere" is replaced by the molten salt.

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This atmosphere-less type of heat treating assures scale-free work, and the accompanying problems of pitting, decarburization, etc. are eliminated. In addition, heating with molten salt is fast—actually as much as 6 times faster than a furnace using radiation or forced convection heating. Consequently, the floor space required for a given production is reduced in the same proportion. Salt bath heating also permits extremely close temperature control, and uniform heating of all parts of the charge, because the surface of the metal is in direct contact with the heat conducting medium. These inherent features of the salt bath have an important bearing on the first cost of equipment. Generally speaking, a salt bath annealing installation will cost only one-third, and sometimes only one-fifth as much as an installation of forced convection or radiant heated controlled-atmosphere furnace equipment.

Efficient Annealing

For the wire industry, salt bath furnaces designed particularly for annealing operations may be said to have arrived at a point approaching perfection. Furnaces with electrode heating units, which provide an electrodynamic stirring action, have eliminated many of the previously objectionable features of externally heated salt baths, such as short pot life, thermal lag, and localized over-heating.

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Metal loss from pickling can be very costly, particularly in descaling stainless steel wire, and the time consumed in scale removal through acid pickling cuts deeply into production. Because salt bath annealing controls atmosphere by virtue of eliminating it entirely, this method has found high favor with producers of high chrome-nickel and stainless steel wire. Witness the results obtained in the following cases:

(1) **One eastern producer, after considerable experimentation with salt bath annealing furnaces, has arrived at an immersion period of only 5 minutes at a bath temperature of 2150°F. as the optimum time-temperature cycle. This short time cycle has substantially reduced metal loss and has held production time to a minimum, with an astounding output per unit of floor space.**

(2) **In wire product fabrication, a manufacturer of automotive timing and industrial roller chains was faced with poor tolerances in his pin stock. Wire used is a carburizing grade of low or medium carbon steel. Manufacturing of the pin begins with a 5/16″ hot rolled rod which is cold drawn to 0.250″ diameter, annealed in a salt bath at 1300°F., air cooled, rinsed, and subjected to a light acid pickle for 10 to 15 minutes. Wire is then given a series of four more draftings, with process anneals as needed between drafts. No scale is formed when annealed in the salt bath, the wire size is unchanged in diameter, and total pickling time is reduced from 60 to about 15 minutes.**

Maintenance of closely controlled temperatures together with the quick, uniform penetration of the heat throughout the stock, has enabled this manufacturer to secure two additional drafts before requiring re-annealing.

Patenting

It has been long established that wire can be given a patenting quench in a salt bath, with results comparable to those produced by a lead quench, both as to grain structure, tensile strength, and other physical properties. Salt bath quenching, however, has one decisive advantage—that of the easier cleaning of the wire following the quench.

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One large wire rope fabricator who has used salt baths for a long period of time, found great difficulty in maintaining uniform temperatures in salt bath furnaces using gas immersion heaters. Also, heater life was short and replacement costs high. Replacement of the gas-fired types with baths employing electrical heat has overcome all previous problems. The electric method of heating the bath has increased production, lowered

costs, and resulted in a high degree of uniformity in their patented stock.

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Substitution of electrodes for gas heating has made it possible to control temperatures throughout the entire bath within plus or minus 5°F. of the control temperature. Since patenting temperatures are extremely critical, the electric method of salt bath heating has been an important development. Whereas it was possible to quench only 800 pounds of wire per hour with gas heating, this manufacturer, with the same size furnace, now runs 2000 to 2500 pounds of wire per hour—and with better end results.

Conclusion

Salt bath furnaces have come of age in the wire industry. Through a constant study of the problems inherent in, and peculiar to the heat treatment of wire, furnace manufacturers have engineered their equipment to a point where its efficiency is demonstrable in many wire mills. Wherever tonnage production of high quality wire is essential, there is an opportunity for these furnaces to function with a minimum of labor costs and a maximum of output.

Fig. 2—1200 pound charge of medium carbon steel wire being annealed at 1300°F. in an Ajax Furnace. Note method of fixturing for suspending wire in the Salt Bath. Even large charges are heated evenly and rapidly, assuring a uniformity of properties.

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This is not to imply that the use of the salt bath is restricted to tonnage items. Special order batches can be run through the salt bath for process annealing speedily, maintaining an unbroken work flow. Salt baths utilized in this manner maintain an excellent balance between small and large production schedules.

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In any steel or non-ferrous wire heat treatment, such as enumerated above, the salt bath method should be carefully examined. With a furnace having no atmosphere problem, the wire mill is assured of constant and uniform heating of the work (within ± 5° F.), using equipment for which the investment outlay is relatively modest. Salt bath processing has earned for itself the right of careful consideration for every wire heat treating operation.

Fig. 1—Annealing fine gauge (.020 in.) nickel-chromium wire at 1950°F. in Ajax Salt Bath. Because of rapid heating, single batch-type salt bath furnace produces same output formerly obtained from 6 controlled atmosphere-type continuous-strand annealing furnaces.

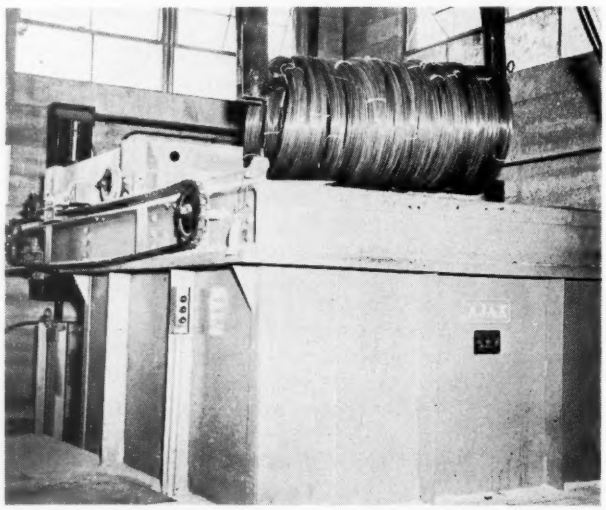

Fig. 3—Annealing of 1500 pounds of steel wire per hour in Ajax Salt Bath. The 700 pound charge shown is brought to the annealing temperature in less than 15 minutes. Ajax Salt Bath Furnaces may be applied to annealing stainless steels of the following types: wire, stampings, rods, weldments, forgings, castings.

Have you made your plans to be in Worcester, Massachusetts, on April 22nd and 23rd? You can't afford to miss this Regional Meeting of The Wire Association. Please turn to page 380-B for complete program details. Besides good papers, you can visit a fine steel wire and rope mill and an excellent electric cable plant.

Extrusion Control

by Dr. F. E. Planer, B.Sc., M.Sc.
London, England

Automatic size control of wires and cables insulated by the extrusion process is increasingly recognized as an essential feature of economical production of rubber and plastic insulated conductors. This article reviews the important advances made in this field in Europe.

Recent Trends

The enormous development of extrusion plants, and the modernization of older plants in the last few years in Europe have brought about a wide recognition of the need for automatic size control.

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The availability of highly satisfactory and moderately priced automatic size controllers have led to their adoption in the majority of European cable works, and a review of the economic advantages obtainable by their use leads one to conclude that within the next few years automatic size control will become a sine qua non with every extrusion plant.

Economic Factors

For a cable to meet a minimum diameter requirement, the unavoidable fluctuation in some six production parameters render it necessary to aim at a given oversize in order to avoid rejection of the product. The cost of producing oversize cable, particularly when 'hand miking' is being employed with consequently larger 'plus' tolerances, are now well known (1). It may nevertheless be of interest to reproduce here a formula which allows to verify readily the annual losses in $ for each extra .001" of wall thickness for different working conditions (2):—

$$\text{Annual Loss for each extra .001"} = \frac{\$\ 8\ P\ R\ D\ s}{}$$

where

P = Price per lb. of insulant in $
R = Relative density of insulant
D = Nominal overall diameter of cable in inches
s = Extrusion speed in yards per hour

The above formula is based on a working year of 250 eight-hour days, and therefore represents in general the lowest possible losses that can be incurred in normal production.

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Typical values obtained from the above formula show that alone on the basis of capital cost of European control equipment, automatic size control pays for itself in much less than a year on rubber and P.V.C. plants (3). In the case of Polythene and Nylon insulated cables, where the raw material costs are correspondingly higher, the initial capital outlay is normally recovered within a few months, which goes to explain the considerable progress made in this direction in Europe and in Great Britain in particular.

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One of the points borne out by the above formula is the already relatively well-known fact that the yearly losses become greatest for the finest wires.

Other Factors

A further reason for the popularity of automatic size control, with the steady increase in labour costs in Europe, is the saving obtained in supervisory costs. The operator, instead of being occupied continuously with the 'miking' and control of one or two machines, is now able to supervise efficiently a larger number of extruders.

Likewise, it is of advantage to obtain more uniform products, and to be able to avoid rejects outside specified manufacturing tolerances. As a result, it has become possible to achieve more consistent overall dimensions of bunched wires, more uniform crosstalk properties in telephone cables, and last, but not least, more consistent high frequency characteristics.

Principle of Operation

Automatic Size Controllers consist in principle of three separate units: a gage head determining the size of the wire or cable, a control unit interpreting the size indications, and a servo-motor acting upon the variable speed gear which controls the haul-off speed of the cable. In use the haul-off speed is thus automatically adjusted as the cable is undersize or oversize so as to maintain the cable diameter accurate within narrow limits.

Two Alternatives

Among the various controller systems, one may distinguish between two main types: The first employs the gage head immediately following the extruding machine, where the coating is still soft; in the other, the gage head follows the cooling tank, or vulcanising tube. In the case of the first method, it is essential not to make physical contact with the still plastic insulation, with the resultant need for greater complexity and cost of the measuring system.

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In the second case, the gage

(1) Set e.g. "WIRE INDUSTRY" (British) August 1953. p. 777.

(2) "KUNSTSTOFFE" (German) November 1953. p. 485.

(3) "Rubber Age" (British) November 1953. p. 385.

head may be in contact with the cable, leading to a simpler and more robust measuring system. It is then necessary, however, to take into account in the control unit the time delays due to the physical distance between extruding machine and gage head. Here moreover, any cooling water adhering to the wire will rule out any non-contact system, such as optical or air pressure devices, since the presence of the water film is likely to give erroneous readings.

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The important advantage of the second system, however, is that the control is based on the final cable size, whereas the first cited method requires control to an intermediate size having regard to the subsequent shrinkage which takes place in the cooling or vulcanising process. The degree of this shrinkage is as yet an unknown factor.

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It is for this reason that the size controllers universally adopted in Europe are of the second type, i.e. the contact gage type.

European Practice

The most widely introduced commercial system is that shown in Fig. 1, which has now been adopted by cable makers in Great Britain, Germany, France, Belgium, Holland, Switzerland, Scandinavia, Spain, Yugoslavia, and other European countries.

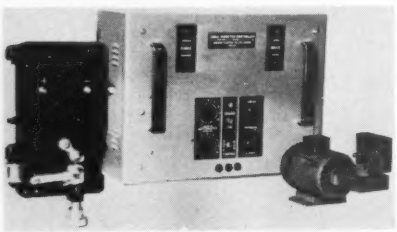

Figure 1—Cable Size Controller: Left: Gage Head. Centre: Control Panel. Right: Servo-motor. By courtesy of the Addison Electric Co., Ltd., London W. 10. * * * * * * * * * * * *

This equipment can be added to any existing extrusion plant with little expense, and Fig. 2 indicates the general lay-out of the system.

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The gage head comprises two stainless steel, ball bearing mounted micro-rollers, the lower roller being set to the nominal diameter by means of a graduated micrometer screw. The unit carries on its front panel "oversize" and "undersize" lights which operate at preset tolerances, the maximum sensitivity of the standard gage head being ca. ± 0.001". The unit is protected against damage from 'lumps' on the cable, and the measurement is not affected by the presence of water.

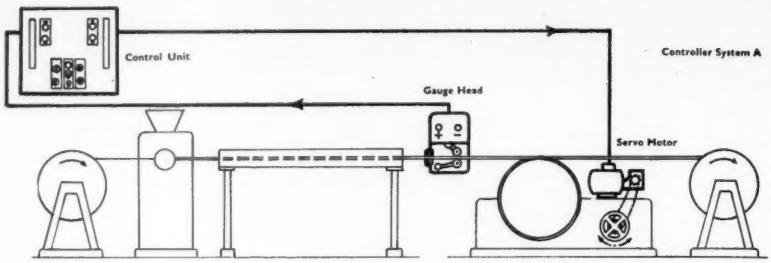

Figure 2—Lay-out of automatic size controller.

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The control unit which is conveniently situated near the extruding machine comprises an electronic circuit which upon appropriate adjustment of the front panel controls, allows the unit to correct diameter errors in a minimum of time, and without the risk of 'hunting' or overshoot for the finest wires up to cables of 1" diameter. An initial integrating circuit, however, prevents operation of the controller on short-timed irregularities in the cable size. Two pilot lights indicate "oversize" and "undersize", and two corresponding lights marked "slower" and "faster" serve as a check on the error correction applied. In addition, two push buttons in conjunction with an Auto/Manual selector allow manual remote control of the haul-off speed, e.g. when starting up the machine.

★ ★ ★

The servo-motor, a small single phase unit with reduction gearing, is arranged to drive via a slipping belt or friction clutch the handwheel which is normally employed to vary the haul-off speed, its action being such as to correct any error in the size of the wire or cable.

Indicating and Recording Controller

Another system which enjoys wide popularity in Europe, particularly where the manufacturing conditions are more stringent, or where expensive insulants such as Nylon or Akulon are being used, is a controller combined with a diameter deviation indicator or a recorder.

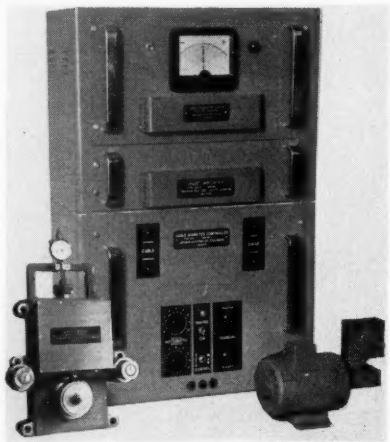

Figure 3—Automatic Cable Size Controller with Indicator or Recorder. Left: Gage Head. Centre: Indicator/ Recorder & Control Unit. Right: Servo-Motor.

One such system is shown in Fig. 3, and its lay-out is similar to that given in Fig. 2.

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The gage head in this case comprises an electromagnetic detector unit with a hardened stylus resting lightly on the cable. The initial setting to the required nominal diameter is made by the aid of the dial gage mounted above the gage head.

★ ★ ★

The control unit comprises an indicating meter or recorder having a linear scale of .005" — 0 —

(*Please turn to page* 459)

Compounding of Electrical Grade Silicone Rubber

by R. Lyle
Chemical Division
General Electric Company
Waterford, New York

This paper, delivered at the Signal Corps Wire and Cable Symposium on December 14, 1953, is published here by permission of the author and General Electric Company.

Since the time some ten years ago, when silicone rubber first became commercially available, it has been the duty of conscientious chemists concerned with dielectric compounding, to consider their use in electrical cable insulation. In the course of these investigations several unusual properties, which were not anticipated, became apparent. It was to be expected that silicone rubber insulated cables would have excellent serviceability at both extremely high and extremely low temperatures; however, more important from the cable manufacturers' point of view was the high dielectric strength achieved, and the phenomenal resistance to ozone and corona. An additional characteristic, which has been exploited, has been the fact that silicones support combustion only with difficulty, and when they do burn they leave a non-conducting ash.

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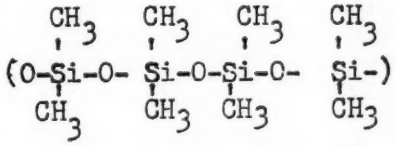
The advantages enumerated here were sufficient to create considerable interest in silicones, and it became incumbent on the suppliers of silicone rubbers to provide an electrical grade insulation. It is with the evaluation of such materials that we shall be concerned today.

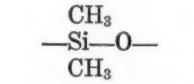
★ ★ ★

Silicone rubber, as presently available, is principally polydimethyl siloxane, with the general formula shown in Fig. 1 and achieve molecular weights in the range of 300,000 to 1,000,000; that

FIGURE 1



is, the



group is repeated from 4000 to over 10,000 times, and represents a very high molecular weight polymer indeed.

★ ★ ★

It has been found that if some of the methyl groups are replaced with phenyl groups, the low temperature properties can be further enhanced; however, since only a small number of those groups (less than 10 Mole %) need to be replaced, this discussion will concern itself with the methyl polymer only, specifically SE-76, and what we shall say will also be largely true of the methyl phenyl polymers such as SE-51.

★ ★ ★

The typical silicone rubber formulation is very simple when one considers the complexity of the typical organic rubber compound. The silicone rubber compound consists of:

1. The gum
2. The vulcanizing agent
3. The filler

★ ★ ★

We have already briefly discussed the commercially available gums, and the vulcanizing agent can also be briefly disposed of. For all practical purposes, silicone rubbers are cured or vulcanized with benzoyl peroxide. Other organic peroxides have been investigated to find some use in specific applications, but benzoyl peroxide stands in much the same relation to silicone rubber as sulphur does to natural rubber—other systems are known and occasionally used, but sulphur remains the standard material.

★ ★ ★

Before we leave the subject of benzoyl peroxide, I should like to digress for a moment and discuss the curing mechanism. It is believed that the benzoyl peroxide, when raised above its decomposition temperature of about 70°C. generates a number of free radicals, and these free radicals abstract hydrogen from the methyl groups, enabling adjacent polymer chains to crosslink through ethylenic linkages. Unfortunately, the course of this reaction is shrouded in just as much obscurity as its analogue in the organic field, the sulphur reaction, and like the sulphur reaction the most that really can be said is that it works.

★ ★ ★

Now, in the course of generating

the free radicals the benzoyl peroxide breaks down with a number of fragments of which the most plentiful and most easily identifiable portion is benzoic acid. To insure maximum stability of the compound these decomposition fragments must be eliminated.

★ ★ ★

Benzoic acid, the principal offender, melts at 122°C. and boils at 249°C., and fortunately is not very soluble in the polydimethylsiloxane polymer; therefore, it is sufficient to hold the compound at an elevated temperature for an hour or two in a well ventilated oven. This gives rise to the "clean-up" cure or oven bake of silicones with which we are all familiar. The third component of our silicone rubber system, the filler, will detain our attention a bit longer.

★ ★ ★

Silicone rubber can be vulcanized with benzoyl peroxide without filler. The product is a rather weak material when fully cured, having tensiles in the neighborhood of 150 psi. elongations of from 50-80% and a negligible tear. Fortunately, fillers are capable of greatly reinforcing the gum. These fillers traditionally are inorganic pigments. The field of organic materials has been rather thoroughly scouted without much success, and the following strictures which one must place on any compounding ingredient will, I think, be sufficient to indicate why:

1. **HEAT STABILITY — the compounding material must have heat stability comparable to silicones— i.e. at least 24 hours at 250°C. without change.**
2. **Inertness toward free radicals— The compounding materials must be inert toward free radicals, and must not compete with the siloxane chains for them.**
3. **COMPATIBILITY—The compounding material must be compatible or readily dispersed in siloxane polymer.**

★ ★ ★

Now there are certain organic polymers which do meet these requirements, but their reinforcing power is slight.

4. **REINFORCING ABILITY—so that the silicone rubber technologist has been forced back to inorganic pigments to seek fillers there.**

★ ★ ★

Fortunately, here we find a good deal of our work already done for us. Most inorganic pigments meet the following requirements:

1. **Heat Stable**
2. **Inert**
3. **Water Insoluble**
4. **Low Moisture Content**
5. **Neutral pH**

★ ★ ★

Most pigments are highly oxidized forms—oxides, sulfides, sulphates, phosphates, carbonates, silicates, and all occur in nature and, of course, have had uncounted ages in which to arrive at a comfortable inertness, and are not troubled by oxygen or free radicals. However, very few ores in nature are required to withstand temperatures of 250°C., so that we must employ only calcined pigments, or pigments with a very low moisture content, in silicone.

★ ★ ★

The water solubility of most pigments is generally quite low. Cape Cod is the only locale I know where sodium chloride is prized as a pigment, and even there one suspects that they are making a virtue of a necessity.

★ ★ ★

However, in examining the commercially available pigments we must add one more requirement, that of a neutral pH. The pH must fall between 4 and 10 at the outside. pH's lower or higher than this are very apt to cause reversion of the polymer. What has been said up to now could be said equally well of any filler used in silicone rubber regardless of its purpose, electrical or mechanical. However, now having gotten this underbrush out of the way, we are in a position to look at the problem we have set ourselves a little more closely.

★ ★ ★

Historically, the earliest fillers used in silicone rubber were titania and zinc oxide in that order. They were and are easy to incorporate into silicone gum; in fact, their great importance in the early days of highly cross linked gums lay in the fact that they were virtually the only pigments which could be dispersed in the gums. However, the linear polymers which we now have, have a vastly increased tolerance for fillers, quite equal to other rubber polymers. Both titania and zinc oxide yielded compounds with reasonably low water absorptions and excellent heat stability. However, they suffered from two distinct disadvantages—a high specific gravity and a high dielectric constant. The high specific gravity made them unattractive to rubber fabricators, for their volume cost was high, and the high dielectric constant made them unsuitable for electrical insulation, generally. For example, a compound with only 14 volumes/100 volumes of gum, zinc oxide has a dielectric constant of

TABLE I - FIG. 3

Compound #	I	II	III	IV
Filler	Calcium Carbonate		Diatomaceous Earth	
Vol.	20	40	20	40
Cure 24/300				
Hardness A	25	40	40	70
Tensile psi	170	240	400	730
Elongation %	440	450	245	160
Water abs. mgm/in^2	26	22	6.7	6.3
Electrical Properties				
% pf	.53	4.2	.70	1.1
dK	3.7	3.4	3.2	3.4
7d/70°C. in H_2O				
% pf	3.5	4.4	1.3	1.5
dK	4.6	5.6	3.5	3.5

6 at 1000 cps. And titania filled materials are equally bad.

★ ★ ★

An acceptable dielectric constant would fall near three with four being the highest value that could be tolerated. The stricture limits us to elements of low atomic weights, and specifically we could guess that silicas and aluminas would be the most desirable materials. However, certain other compounds find use in conventional compounds. For example, whiting or calcium carbonate has an old and honorable history. In Fig. 3 four silicone rubber compounds are presented with calcium carbonate and diatomaceous earth as fillers at 20 and 40 volumes/100 volumes of gum loadings.

★ ★ ★

Diatomaceous earths are essentially pure silicon dioxide, and the superior reinforcing power of the silica is apparent. It will be noted that the water absorption of the diatomaceous earth is much lower and that this low water absorption is reflected in a lower and much more stable power factor and dielectric constant.

★ ★ ★

However, the diatomaceous earths used must be selected with some care. For example, in Fig. 4 two diatomaceous earths are compared. Compound VI here is similar to compond IV in Table I. It will be noted that the lower water absorption compound has much superior electrical properties and greatly improved electrical stability.

★ ★ ★

Diatomaceous earths do not represent the only source of silicas available to us, and an important consideration in the selection of a silica is the particle size. For example, in Table III, Fig. 5 there are tabulated three silicas which differ widely in their particular size. These fillers are compounded at 20 volume loading/100 volumes of gum.

Compound I contains a calcined mechanically ground silica with particles in the range 10-50 microns.

Compound II contains a calcined diatomaceous earth with particles in the range 1-5 microns.

Compound III contains a calcined precipitated silica gel with particles in the range .01 to 0.1 microns.

★ ★ ★

It is obvious that the smaller the particle size the better the reinforcement; however, very fine particle size silicas bring other problems in their train, which fortunately is beyond the province of this paper.

★ ★ ★

However, fine particle size silicas are subject to the same stricture as other compounding materials, for example, in Table IV, Fig. 6 there is tabulated the physical and electrical test results of three fine particle size silicas.

TABLE II - (FIG. 4)

Calcined Diatomaceous Earths
40 Volume Loading

Compound #	V	VI
Cure 24 hrs/300°F.		
Hardness Shore A	65	70
Tensile in psi	650	650
Elongation in %	110	110
Water Absorption mgm/in^2 (7 days at 70°C.)	21.6	5.2
Electrical Properties		
Initial		
% pf	1.9	.67
dK	3.4	3.4
IR in MMO cm	300	1000
After 7 days at 70°C. in H_2O		
% pf	2.3	0.94
dK	4.0	3.9
IR in MMO cm	70	200

TABLE III - FIG. 5

20 Volume Loading in SE-76

Compound #	I	II	III
Silica Source	Ground Silica	Diatoms	Ppptd Gel
Particle Size Range	10-50 microns	1-5 microns	.01-0.1 microns
Cure 24/300°F.			
Hardness, Shore A	20	40	65
Tensile psi	70	400	800
Elongation in %	230	240	300

TABLE IV - FIG. 6

Fine Particle Size Silicas at 20 Volume Loading

Compound #	I	II	III
Silica	Fumed Silica	Precipitated Silica	Silica Aerogel
Cure 24 hrs/150°C.			
Hardness Shore A	65	51	65
Tensile psi	770	800	740
Elongation %	280	300	280
Water Absorption			
7 days/70°C. mgm/in^2	3.7	34	120
% pf	.39	.54	.55
dK	3.0	3.3	2.8
After 7 days at 70°C. in water			
% pf	.60	5.9	28.5
dK	3.5	5.4	45.8

Compound I contains a fumed silica.
Compound II contains a precipitated silica.
Compound III contains a calcined silica Aerogel.

★ ★ ★

It will be noted that the three fillers reinforce to about the same extent, and are uniformly good. The dry electrical properties are very similar and uniformly good. However, we can notice a wide difference in their water absorption, and this difference in water absorption is reflected in startling changes in the electrical characteristics after seven days soak in water at 70°C. Compound I, with a low initial water absorption has changed very little. Compound II, with a moderately high water absorption shows a sharp decrease in electrical stability, especially in the % power factor, and compound III with a very high water absorption has become virtually worthless as a dielectric material.

★ ★ ★

I might add that too much emphasis should not be placed on the differences in manufacturing methods here. These particular data happened to be at hand; however, precipitated silicas which are in every way equivalent to fumed silicas, are now being marketed, and we have seen some which are still unfortunately only laboratory curiosities which are superior.

★ ★ ★

The silicas have been rather extensively discussed because we have a number of silicas to choose from. The aluminas are not in such a satisfactory condition, and at present there are no commercially available aluminas which can compete with silicas. Most of the aluminas yield properties very like ground silica, i.e. very low reinforcing power. Laboratory aluminas are available which hold great promise, but in this discussion I have limited myself to discussing only commercially available materials.

★ ★ ★

Since silica and alumina are both good, the question naturally arises —how does a material such as kaolin $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$ perform, and as might be expected it performs very well, indeed, if the water of hydration is completely removed. In Table V (Fig. 7) a calcined kaolin is compared with a calcined diatomaceous earth. The calcined kaolin is comparable in every way and gives some indication of being superior. A word of caution is in order here. The requirements for clays are very stringent, indeed, and we have found that only highly calcined

(*Please turn to page* 437)

TABLE V - FIG. 7

Diatomaceous Earths and Calcined Kaolin

Compound #	I	II	III	IV
Volumes	20	40	20	40
Filler	Diatomaceous Earth		Kaolin	
Cure 24 hrs./300°F.				
Hardness Shore A	40	70	30	65
Tensile in psi	400	730	410	660
Elongation in %	240	160	290	180
Water Absorption 7 d/70°C. mgm/in^2	6.7	6.3	5.4	8.6
Initial % pf	.70	.97	.29	.34
dK	3.2	3.4	3.0	3.3
D/S	390	400	430	420
7 d at 70°C.				
% pf	1.3	1.5	.60	.68
dK	3.4	3.0	3.5	3.9
D/S	420	440	450	330

Wire and Cable Symposium

At the 1953 Signal Corps Symposium on Wire and Cable, held on December 14-16, 1953, at Asbury Park, New Jersey, there were a number of papers presented that it will not be possible to publish in Wire and Wire Products.

★ ★ ★

For the sake of completeness, a brief review of such papers is presented here to enable readers to determine whether or not they are interested in the full text, requests for which should be directed to the authors.

★ ★ ★

These summaries follow:

"Use of Silicones in Shipboard Cables" by G. Michael Van Lear, Navy Dept., Bureau of Ships, Washington, D. C.

Silicone and silicone treated materials used in many ways by the Navy, of which electrical cables is one. Use has been emphasized by need for reducing size of shipboard cables, which necessitated designing new cables based on silicones, resulting in a new purchase specification in 1948: MIL-C-2194, which supplants the type HFA cables previously used. The features of the new cable, the tests to which subjected, and the advantages are stated.

★ ★ ★

"A New Material for Splicing Wire and Cable" by E. W. Bollmeier, Chf. Eng., Electro-Mechanical Products Engineering, Minnesota Mining & Manufacturing Co., St. Paul Minnesota.

This paper discusses the progress in the techniques of using liquid epoxy casting resins in splice insulation, the object being to make a splice with insulation properties equaling that of the original. The system is intended to produce with this resin, insulating characteristic for which the method and not the skill of the operator, will be responsible for the desired results.

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A description of these resins and of the method of application is given. The resins are mixed without the use of heat as they are needed, in the plant or in field service, poured into a mold and allowed to cure, after which a moisture-tight, void-free connection of high insulating value will have been formed.

★ ★ ★

"High Voltage-High Temperature Rubber Insulation" by W. H. Couch, Chief Chemist, and W. K. Freeman, Electrical Engineer, Simplex Wire & Cable Company, Cambridge, Massachusetts.

Anhydrex XX, a new insulating rubber developed by Simplex, is the subject of this discussion. The material is resistant to ozone, to heat deterioration and to loss of dielectric properties on severe heat aging. For high voltage and high temperature applications this new rubber is considered to permit higher conductor operating temperatures in wet or dry locations than previously has been possible. Some 27 illustrations and charts support the paper.

★ ★ ★

"Prelashing Aerial Cable" by C. Shafer, Jr., Bell Telephone Laboratories, Murray Hill, New Jersey.

"Aerial Cable" in this paper means a telephone line supported on poles, in which the conductor is copper with a lead or polyethylene sheath, supported by a steel strand, to which the conductor is lashed or tied at intervals. Early practice was to lash with a heavy, tarred jute cord. Later, wire loops called cable rings were used. At present, the practice is to prelash the strand to the cable with a corrosion resistant wire. This involves new techniques of installation that are described. Prelashing shows economies with trained crews and where 1,000 feet or more of cable are installed in normal situations.

★ ★ ★

"Electromagnetic Delay Lines" by H. G. Nordlin, Federal Telecommunications Laboratories, division of International Telephone and Telegraph Corp., Nutley, New Jersey.

Describes two types of devices used for time delay of electric signals. These are the lumped-parameter and the distributed-parameter. After a brief discussion of the first type, the paper devotes its principal attention to the second, covering the properties that are considered ideal for a distributed parameter delay cable. The author shows the kinds of deviations that occur from this ideal in some high quality cables and points out the improvements that appear to be possible from data gathered from experiments.

★ ★ ★

"Thermoplastic Insulated and Sheathed Telephone Cable for Rural Electrification Administration Telephone Borrowers' Systems" by A. L. Ritchie and J. L. Robb, Telephone Eng. Div., R.E.A.

Paper points out that use of plastic cable in telephone systems has increased greatly and that standards should be established for such applications. It has long been the policy of R.E.A. to establish standards or to utilize those established by other organizations like ASTM, ASA, EEI, and AAR. The authors present REA tentative specifications for this type of wire, devoting space in their paper to a discussion of the design and constructional details of the plastic insulated cable.

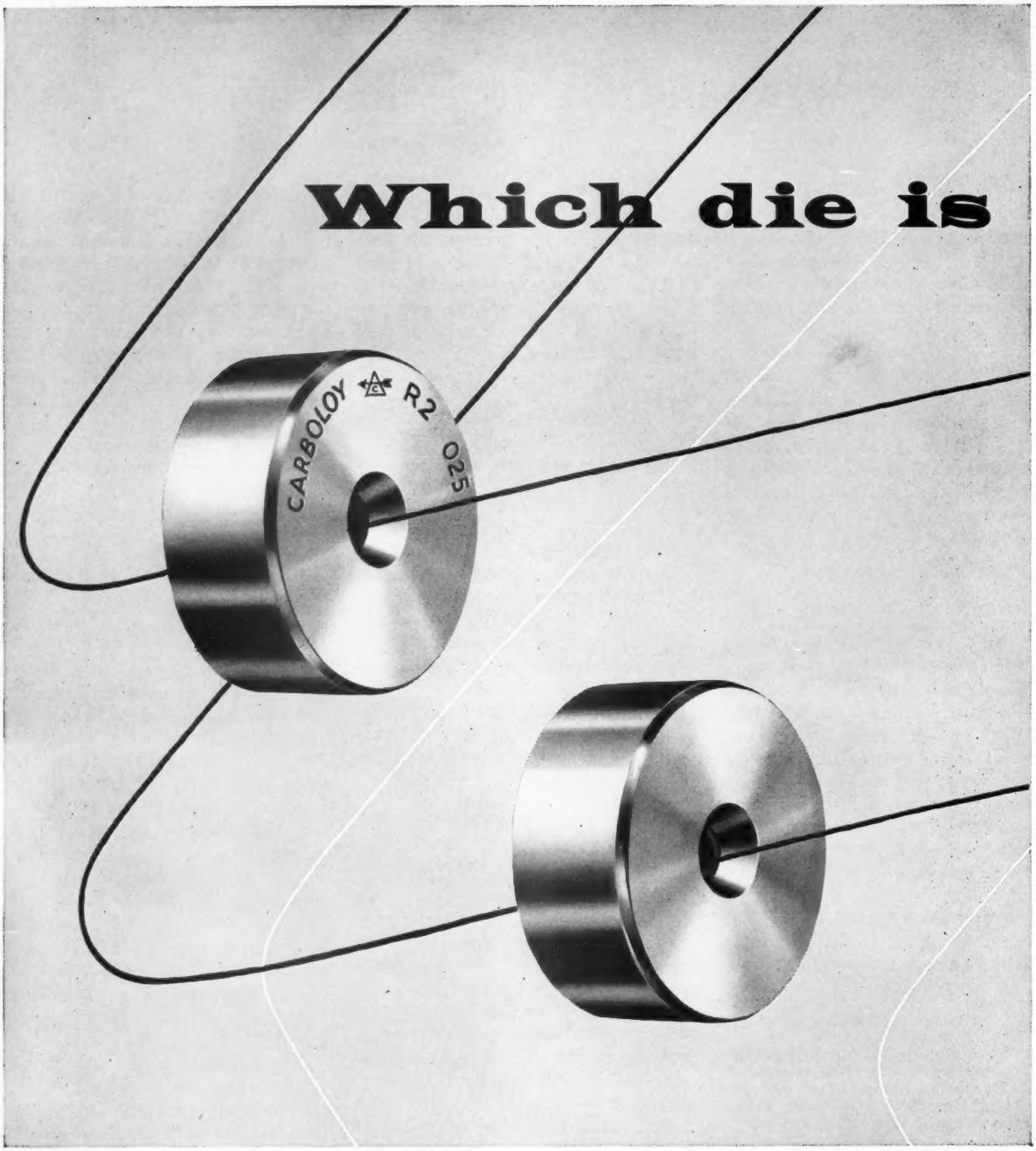
★ ★ ★

"Model Tests of a Surface Wave Transmission Line for Long Distance Communication" by G. Goubau and C. E. Sharp of the Signal Corps Engineering Laboratories at Red Bank, New Jersey.

★ ★ ★

The practicability of employing wide band signals over long distances has been under study for three years, the authors state. Results indicate that band widths of 100 mc/s or more will be efficient and the installation economical. The average loss may be 3 to 5 db per mile in theory and possibly 10% higher due to imperfections

(*Please turn to page* 457)



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Arc-Welding Electrodes and Their Manufacture

by I. G. Fritz, Dip. Eng.
Translated by Dr. Jerome W. Howe
Worcester, Massachusetts

This article, which appeared in the September, 1953, issue of Draht, and is published here through their courtesy, gives a brief history of coated electrode processes and describes current practice in electrode manufacture in Germany.

By electrodes is commonly meant the specially formed current terminals between which any electrical process is to take place. For example, the variously formed terminals between which the work piece is clamped in resistance welding are called electrodes as well as the gigantic carbon rods in our electric smelting furnaces, or the anode and cathode terminals for electrolytic processes.

★ ★ ★

There are only a few branches of manufacture which have been so wrapped in secrecy as the manufacture of electrodes for arc-welding. The only booklet published for years, that by Lawroff, told the technical expert nothing new respecting their preparation; brought forth, however, an extensive statement of the patent situation of that period, particularly the so-called Kjellberg patent. Kjellberg is incorrectly even today, especially outside of Germany, often spoken of as the originator of the coated electrode. In the Ottenser Iron Works Kjellberg, as a supernumery, many years ago, learned there and also elsewhere of secretly designed coated rods and their advantages. Kjellberg, however, went to the bottom of the matter, improved the coating essentially, and received three international patents, that in part rested upon false premises; these patents, however, procured him an assured monopoly. Kjellberg instituted countless legal suits, which he won for the most part, because at that time the action of the coating and the operation of the arc had not yet been explored.

★ ★ ★

Several electrode manufacturers were able to maintain themselves in spite of this, so that progress was not completely halted. The coated rods were for the most part considerably more expensive than the bare rods; but the years-long controversy between the experts has by now been decided favorably to the coated rods. In Germany the defenders of the bare rods have at last desisted. The manufacturers of direct current welding converters and rectifiers support of course the use of bare rods, which until recently were satisfactory only with direct current. The bare rods can today, however, be satisfactorily welded with the high-frequency oscillator which is connected in series with the transformer. Bare wire is practical as yet only in isolated cases of secondary work. Outside of Germany the triumph of the transformer in association with the coated electrode began several years earlier.

★ ★ ★

In the course of the controversy the cored wire was brought out by Bohler, which appeared bare outside but contained a finely divided substance inside; the common use of these wires, with the exception of the alloyed cored wires, can now be considered as superseded. When the superiority of coated rods began to be recognized, several firms offered already existing pastes for use. That, however, of necessity led to failures, because the coating must be tuned with the core. For years the rods were only dipped, and only about 15 years ago pressed-coated rods appeared on the market. As intermediate steps, there were asbestos and paper-wrapped rods, which by today have likewise been superseded. The coated rods of today are almost all, with the exception of N.E.—and a few high-alloy E—electrodes, equally satisfactory to use with direct and alternating current.

★ ★ ★

The Russians announced coating recipes and researches, and it was believed by many that profit could be drawn therefrom, as likewise out of patent notices. By the outbreak of the second World War the German electrodes, respecting quality and abundance, withstood the competition of the rest of the world. During the war, however, the quality as well as the abundance of types, diminished because important raw material for the coating and alloy metal from outside of the country was lacking. The former high point has however again been attained. Today the deeply fused contact and lime-

In this Continental fibre drum is a secret that can change the habits of the entire wire industry

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Atlanta • St. Louis • San Francisco • Los Angeles • Eau Claire

base or low-hydrogen electrodes are manufactured, so that all imports have become dispensable.

★ ★ ★

The coating in electric welding has as its objects:

(1) The stabilization of the arc through easily ionizable bodies, for example, for the welding with alternating current indispensably necessary in cases where one favors the ionization by high-frequency oscillators or does not wish to use an unduly high voltage.

(2) The screening of the liquid melting bath against acid and nitrogen in order to prevent oxidation and nitriding of the steel; finally in order to prevent the formation of hydrogen, for example, through damp coating whereby so-called 'fish-eyes' break out and also other defects in welding may result.

(3) The formation of slag, in order to bring about a retardation of hardening and therewith a tempering and clean surface of the weld.

(4) The substitution of the alloying constituents which vaporize out of the wire core by the melting down.

★ ★ ★

Formerly distinction was made between carbon and metallic arc welding; today one speaks of open, shielded and submerged arc. By this latter the arc burns underneath the slag coating, for example, by the contact electrode and by Unionmelt process, by which the slag is not put on the rod as a coating but is sprayed through a pipe directly upon the place of the weld, while with contact electrodes it is in the coating.

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The manufacture of the coated electrodes proceeds as follows: the wire, delivered in coils, is, if the electrodes are to be only thinly coated, immediately cut into lengths (up to 2.5 mm diam. in about 13 inch lengths, over this size about 18 inches). The rods are then gripped by a clamp and dipped in a tank of coating paste one or several times and then dried in a drying closet. The coated electrodes with medium and thicker coating, on the other hand, are extruded by hydraulic pressure like, for example, the lead sheathing on cable.

★ ★ ★

The wire is passed centrally through a die through which simultaneously the coating in ring form also passes. Then the coated wire is, as above, cut into lengths; the electrode holder end and the other end freed from the preparation by wiping, after which the electrodes are sent to the drying closet. Finally the surfaces of the holder are provided with a coat of paint. The packing follows,—of 50, 100, or 150 stick cartons, on which are marked the identification and characteristic properties of the coated rods.

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For electrodes the tentative standard DIN 19 133 (June 1942 edition) is valid. According to the new German proposed standards, the rods will in future be designated by letter, number and symbol. For example, Kb 51 Us 42 G+ VE 34/52Z. Kb51 informs that it is of a lime-basic coating type. Us indicates thickly coated, 42 is the mean tensile strength in kg/mm^2; G+ means by direct current with the positive pole to weld; V indicates weldable in all positions; E 34/52 indicates to be used for electro-welding (G for gas welding) of steels with 34 to 52 kg/mm^2. Six groups of coating types are distinguished: Ls, arc stabilizer; Ti, titanium dioxide (rutile acid); Kb, lime-basic; Es, ore acid; Ze, cellulose; and So, special type. The Ls type includes mostly thinly coated, optionally only powdered electrodes. The coating aims only to stabilize the arc through easily ionizable bodies as chalk, lithium salts, etc.

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These rods will be used only for the electric cold-welding of castings and minor work, because of the lower quality. The Ti-type contains in the coating titanium dioxide (rutile), has a weak acid reaction, is mostly coated with medium thickness, constitutes a cold-working electrode which achieves a slow flowing but rapid hardening weld with normal penetration, and permits of satisfactory welding in all difficult situations and is suitable for wide joints, but is little capable of current overload.

★ ★ ★

The Kb-type furnishes the highest quality grade; outside of Germany is called hydrogen-poor, has fast fusing time and best output, permits of welding in all difficult situations and may be shortly the most widely used. The Es-type is ore acid; the Es-electrodes are hot-working, mostly medium and thickly coated; achieve good penetration and rapid fusing time; they are, however, in practice only used in difficult situations. The welds are of high quality, have especially high notch toughness; are for the most part, however, used for steels up to St 52. The Es-type is under certain conditions also used for the welding of Thomas-steels. The Ze- or cellulose-type is less used here. The electrodes form much buffer gas and little slag; it is difficult to make the weld free of pores. The large emission of fumes makes removal by suction advisable. In the So-type are included the contact, deep penetration, cutting, and under-water welding and cutting electrodes, also the tube electrodes for the Oxikop process, the flexible tube electrodes for copper welding, finally the thermo-electrodes which, without leaving a penetration, serve only to heat the work-piece by the arc.

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The uncoated electrodes are divided into the bare rods (N), and the cored rods (S). For the Elin-Hafergut process special coated electrodes are prepared; the former automatic welding machines use either bare wire from the coil or also coated and steel braided special wire. Only the Kaell-Automatic and recently the Quasi-arc three-phase transformer use double electrodes, while the Kjellberg V-Automatic uses every standard coated electrode. The Metron half automatic uses half-round pressed-coated rods with a bare sector, and without waste because the pin of the fused electrode is set in the bore of the new one.

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In England there have appeared of late two electrode classifications: that of the Bama (British Electric and Allied Manufacturing Association) registered under IOW, and that of BSI (British Standard Institution) registered under BS 1719/1951. Thus for example the electrode E527 is a pressed coated rod (E for extruded); 5 denotes the type of coating (in this case oxide

(*Please turn to page* 451)

Government Wire Production Information

More Aluminum Available To Fabricators

More than 70 million pounds of primary aluminum made available as a result of production from new facilities will be purchased by independent fabricators during the first quarter of 1954, **Edmund F. Mansure,** Administrator of General Services, announced recently.

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Mr. Mansure said this amount was offered by the three major producers to non-integrated users and is approximately 90 per cent more than contracts with GSA require to be offered.

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Total estimated aluminum production for the quarter will be 693,200,000 pounds. Of this amount, 260,887,000 pounds will come from new facilities.

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The amount which must be offered to non-integrated users is two-thirds of the new production, less: (1) A proportionate share of set-asides for the Atomic Energy Commission and Department of Defense and; (2) the requirements of the national stockpile from new aluminum facilities.

★ ★ ★

In the last quarter of 1953, users bought 101,000,000 pounds made available as a result of new production. Total production for that period was 651,000,000 pounds and 231,000,000 pounds came from new facilities.

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GSA has this type of contract with **Aluminum Company of America, Reynolds Metals Company** and the **Kaiser Aluminum & Chemical Corporation.**

★ ★ ★

Under the contracts, for the first five years from the time expansion of facilities started, the companies agree to offer the two-thirds percentage presently in effect, and for the following 15 years they will offer 25 per cent of expanded production under the same rules.

Appointed Chief of Mechanical Instruments Section of NBS

Edward C. Lloyd has been appointed Chief of the Mechanical Instruments Section of the **National Bureau of Standards,** following the retirement of **Dr. W. G. Brombacher.** Mr. Lloyd has been acting as Assistant Chief of the Office of Basic Instrumentation at NBS, a position which kept him in close touch with developments in the field of mechanical instruments.

★ ★ ★

In addition to the establishment, maintenance, and improvement of

MICROMETER PRECISION — MICRO-WELD TRADE MARK REGISTERED

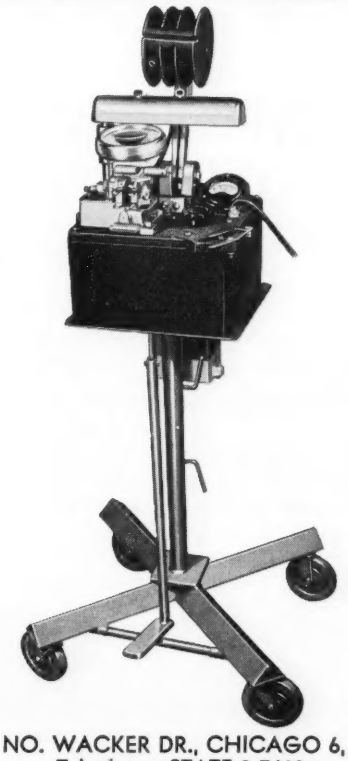
MODEL S.E.M.T. MICRO-WELD BUTT WELDER

This welder was designed and developed expressly for welding all types of fine wire: Aluminum, Copper, Brass, Bronze, Steel and Steel Alloys, ranging in size from .005" to .020" diameter.

Unit design of frame, transformer and power sub-assemblies permit other range of sizes to suit requirements.

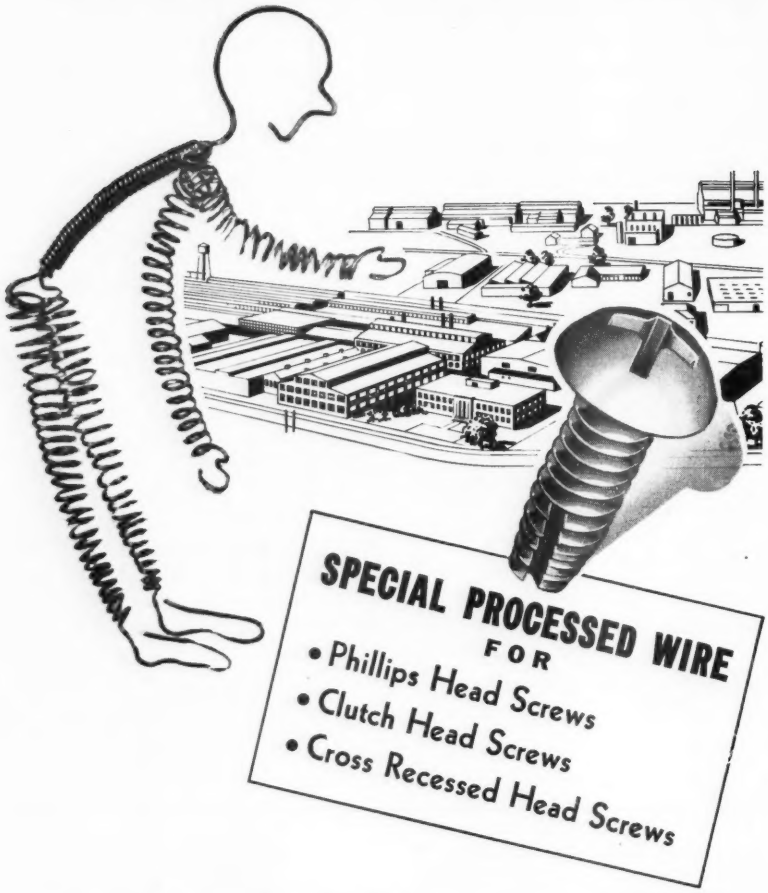
Equipped with a temperature indicating annealing and tempering device, voltage regulator and meter to compensate for voltage fluctuation, wire cutters, extra large 5" diameter magnifying glass, fluorescent light and extension cord. Welder can be supplied for bench mounting, or mounted on 4-wheel truck.

The adaptability of this unit for welding all types of wire, either ferrous or non-ferrous, in sizes from .005" to .020" diameter, makes it ideal for the fine wire manufacturer.



MICRO PRODUCTS CO.,

20 NO. WACKER DR., CHICAGO 6, ILL.
Telephone: STATE 2-7468



PRODUCTION CAPACITY DOUBLED

To keep pace with the rapid increase in the use of recessed head screws, Keystone is doubling its capacity in the manufacture of "Special Processed" wire.

The unusual qualities of Special Processed Wire are recognized by licensed manufacturers of recessed head screws. This wire has also proved itself superior on many other difficult cold heading jobs.

Our additional capacity will enable us to meet the ever-increasing demand for "Special Processed" wire by our present customers and at the same time welcome new customers.

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

the standards for pressure and humidity, the NBS mechanical instruments program is concerned with improved performance and utilization of sensing elements based on mechanical principles either by the utilization of improved materials or by the application of new developments in other branches of science and technology. In this way the program plays a part in meeting new requirements in such fields as aircraft research as well as in industrial work.

★ ★ ★

Mr. Lloyd came to NBS from the Navy Department, Bureau of Ships, where he had served for two years as Principal Marine Engineer. From 1939 to 1943 he had risen in the Bureau of Ships from Junior Mechanical Engineer to Marine Engineer.

★ ★ ★

Mr. Lloyd was born in Chicago. He received a B.S. in engineering from the University of California in 1938. He is the author of various technical articles and is the holder of three patents concerned with marine engineering.

Appointed Chief of the Engineering Metrology Section of NBS

Irvin H. Fullmer, an authority in the field of precise length measurements and screw thread standardization, has been appointed Chief of the **National Bureau of Standards** Engineering Metrology Section, formerly designated the Gage Section. During his more than thirty years of service with the Bureau, Mr. Fullmer has made many significant contributions to the science of precision measurement, particularly to the measurement of length by contact and interferometric methods, the standardization and design of screw threads, and the calibration of precision gage blocks.

★ ★ ★

Mr. Fullmer joined the NBS staff in 1917 as a laboratory assistant. During 1920 and 1921 he was a partner in the Gage Engineering Service Company. He rejoined the

Bureau staff in 1921 as a physicist in the Gage Section.

★ ★ ★

He is a native of Elyria, Ohio. He received a B.S. degree in physics from the Case School of Applied Science (now the Case Institute of Technology) in 1917. He is Secretary of the Interdepartmental Screw Thread Committee, Chairman of the Federal Specifications Board Technical Committee on Bolts, Nuts and Screws, Chairman of the American Standards Association Subcommittee Number Eight on Screw Thread Nomenclature and Symbols of Sectional Committee B1, and Chairman of the American Standards Association Subcommittee Number Ten on Glossary of Terms for Mechanical Fasteners of Sectional Committee B18.

Plans Third Analytical Instrument Clinic

The Instrument Society of America announces plans for the Third Annual Analytical Instrument Clinic to be held in conjunction with the First International Instrument Congress and Exposition to be held in Philadelphia, September 13-24, 1954.

★ ★ ★

The Clinic which is scheduled for September 13, 14, and 15 will be a lecture and demonstration course on the latest and most advanced analytical instruments. It is planned primarily for the benefit of technicians, engineers, physicists, and chemists who are using or contemplate using these instruments.

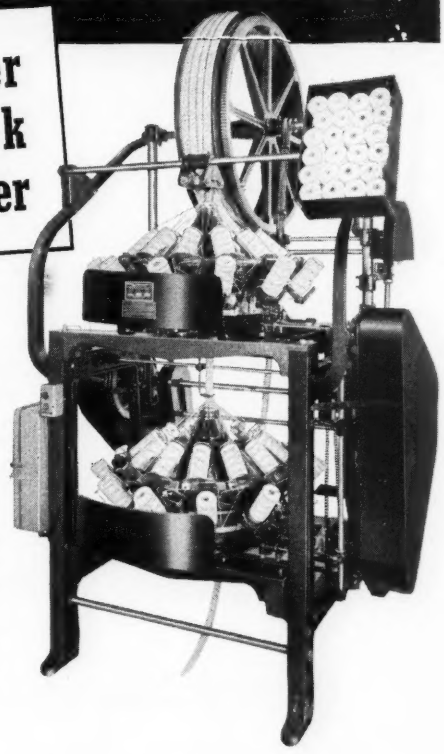
★ ★ ★

Advance registration will be required. Any number of sessions, up to five, may be attended. The sessions on each instrument will be small and will be repeated up to a maximum of five times. For registration forms and further information write to **Dr. Axel H. Peterson, Mellon Institute,** 4400 Fifth Avenue, Pittsburgh 13, Pennsylvania.

Experience is the only sure-fire cure for inexperience.

THE NEW "WARDWELLIAN"®

24-24 Carrier Double Deck Cable Braider



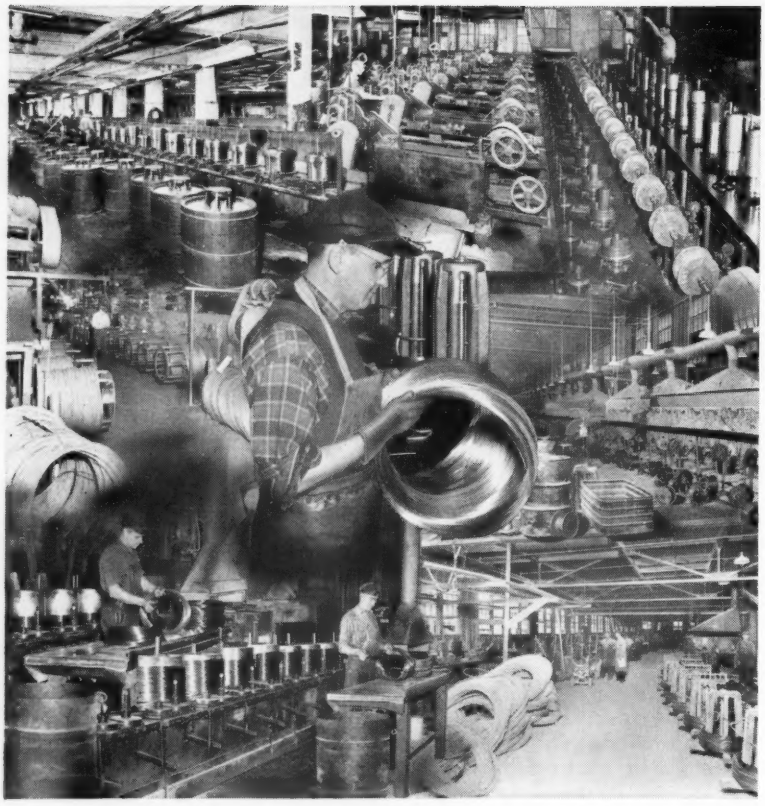
This machine has all the features of the WARDWELLIAN Cable Braider, plus the added feature of applying two layers of braid simultaneously. Each head can be adjusted individually to give the desired number of picks or plaits for each layer of braid.

Machine is driven by a three horsepower adjustable speed motor that gives great flexibility of operation through the dial control. Power is transmitted from motor to braider through the medium of a Maxitorq Floating Disc Clutch mounted on the countershaft.

- Production 44" to 340" per minute depending upon the texture of the product.
- Standard set of eighteen change gears for varying takeup furnished with each machine.
- Standard set of ten change gears for varying speed of lower head furnished with each machine.
- Carrier speed 75 R.P.M. for cables ¾" diameter to the maximum of 1⅛" diameter or 500,000 circular mils; production 900 picks or plaits per minute.
- Carrier speed 100 R.P.M. for cables ¾" diameter and under, 1200 picks or plaits per minute.
- Speed of braider countershaft 345 R.P.M. for carrier speed of 75 R.P.M. or 460 R.P.M. of countershaft for carrier speed of 100 R.P.M.
- Ratio braider countershaft speed to carrier speed 4.6 to 1.
- Carrier speeds can be varied from a maximum of 100 R.P.M. to a minimum of 33 R.P.M.
- Capstan 36" diameter, 6" face.
- Beater openings in both upper and lower heads 1¾" diameter.
- Supply yarn packages Universal wound, 2 11/16" dia., 5" traverse, on tube 5¼" long, ⅝" hole, four point wind.
- Supply and windup stands not furnished.
- Machine can be adapted for producing one-and-one braid by changing thread deflectors.
- Counter for measuring in feet or yards furnished upon request.
- Weight approximately 2500 lbs.

REPRESENTATIVES FOR EUROPE, BRITISH COLONIES AND DEPENDENCIES
JAMES MACKIE & SONS, LTD.
BELFAST, IRELAND

Wardwell
BRAIDING MACHINE CO.
CENTRAL FALLS, RHODE ISLAND, U.S.A.



High Carbon Specialty Wire

Using atomic energy only for the atomic bomb is like using electricity only for the electric chair.

American progress must not be confined to war alone. But discoveries that have their first conception in self preservation through force can be turned to use in peaceful pursuits. We are doing our part in defense production, but we also have a clear vision of work for a peaceful, happier America—carrying on with lessons war production has taught us—to meet in the most economical way the exact requirements of industry.

JOHNSON STEEL AND WIRE COMPANY, INC.

WORCESTER 1, MASS.

New York Philadelphia Pittsburgh Cleveland Detroit Akron
Dayton Chicago Atlanta Houston Tulsa Los Angeles

A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

ABSTRACTS

METHODS OF WIRE PRODUCTION
K. V. Aiyer (Indian Inst Sci, Bangalore). Indian Inst Met Trans 1951 Vol 5 pp 95-110 (TP 52)

Description of up-to-date wire drawing machines differentiating between slip-type and slipless accumulation type machines. Wire drawing lubricants and dies. Hardened steel dies improved by chromium plating; sintered carbide dies first lapped with boron carbide of 250 mesh mixed with fairly light mineral oil; final polish by diamond powder of successively finer grades suspended in castor oil. Procedures for producing following wires: steel, aluminum, duralumin, and nail wire (Al-alloy). Considerations on power consumption. 10 illustra, 7 ref, 3 tables.

★ ★ ★

OPTIMUM DIE-PROFILES FOR WIRE DRAWING
E. Haidegger. Zentralbl Ungar Technik, Aluminium (Budapest) 1952 Vol 4 (2) pp 33-37; Feingeraetetechnik 1953 Vol 2 (10) insert pp (Oct) (In German; original in Hungarian)

Die-profile influences drawing force; consists of die dia, entrance angle, and length of cylindrical portion (bearing). Optimum values for these quantities vary with type of material and dimensions. Profile measurable by replica, interference instruments, with feelers, or by measurement of wire head. 5 illustr, 1 table.

★ ★ ★

A REVOLVING DIE SOAP BOX
Ets Victor Liné. Wire Ind 1953 Vol 20 (240) p 1193 (Dec)

Revolving die soap box for Line-Gorcy descaling machine suitable for acid pickled wire. Mainly used for first hole, but small revolving boxes may be used for following holes of continuous machines. Die is driven by passage of wire over roller, and makes one ray per yd of wire passing through box at 500 to 600 ft./min. Cooling by water jet on die. Soap agitator is driven round inside box by action of revolving die; entry cone maintained in perfect condition due to wire entering die at angle. Die life said to be increased, dies to remain round, and greater drawing speeds obtained. 1 illustr.

★ ★ ★

PRODUCTION OF ULTRA-FINE WIRES BY ELECTRO-POLISHING
J. Ogermann. Przeglad Mech (Warsaw) (1953 ?) Vol 12 (1) pp 35-37; Feingeratetechnik 1953 Vol 2 (10) pp 472-473 (Oct) (In German; original in Polish)

Application of electropolishing to production of ultra-fine wires by continuous process. Wire passes through electrolytic bath; current adjusted step by step after polarization equilibrium reached. Prior to this, metallic decomposition intense and may even dissolve wire. Length of bath 25 to 50 mm. Speed of traverse main control for regulating dia of wire; dia continuously checked by resistance measurement. Self-regulating process based on stabilization of speed with which metal enters into solution after a certain degree of saturation reached. Thus even relatively large variations in current have little effect on finished dia. Dia of 18/8 steel wire uniformly reduced from 10 to 3.75 micron. 3 illustr, 4 ref.

★ ★ ★

THE ROLE OF THE LABORATORY IN STEEL WIRE MANUFACTURE

W. A. Sandilands. Wire Ind 1953 Vol 20 (240) pp 1177-1179, 1181-1182 (Dec)

Functions of lab defined as control of raw materials and processes, research and development, reviews and statistical control, assistance to sales dept, standards and specifications. Heat treatment, cleaning and coating, drawing lubricants and die polishing powders dealt with under first heading. Practice of preparing and dispensing in lab Norbide (boron carbide) and diamond polishing powders ready mixed for use found economical. When abrasives containing diamond used for diamond or sintered tungsten carbide dies, washings removing abrasive from die should be collected, and impregnated chips cut off in reshaping polishing sticks saved; diamond reclaimed by suitable treatment followed by washing and refinement; grading by elutriation. Scrap diamond dies may be crushed to powder in lab. Expense of lab justified through savings in materials and scrap, plant development and increased production efficiency. 6 ref.

★ ★ ★

THE STUDY OF HIGH-SPEED WIRE DRAWING: PROBLEMS OF HEAT AND LUBRICATION

J. G. Wistreich. Met Treatment etc 1953 Vol 20 (98) pp 530-533 (Nov)

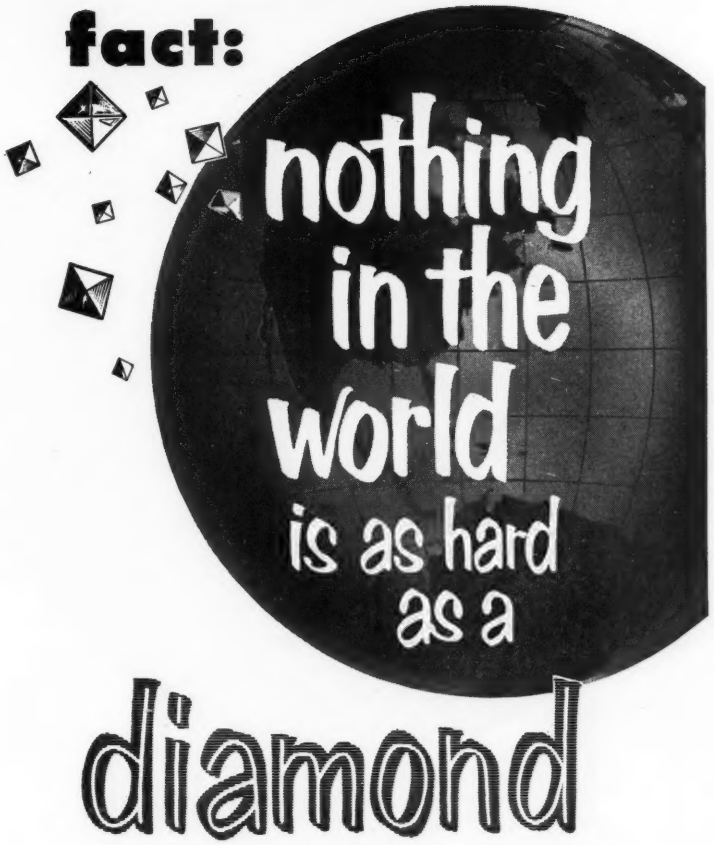
Heat in die increased with high drawing speeds of last 2 decades, as result of plastic deformation and friction. 'Bulk' temp rise is independent of wire size and speed, varying with reduction and hardness, and inversely with density and specific heat. Temp rise due to friction thought to vary with die pressure and friction coeff, inversely with thermal diffusivity of wire, and to be proportional to square root of speed and wire size. Bulk temp only reduced by having incoming wire as cold, and reduction as light as practicable. Surface temp may be treated by reduction of pressure and friction, 'back pull', and light reductions at high speeds. Chief function of thin film lubrication is prevention of metal-to-metal contact of sliding surfaces by organic solids, eg soaps and waxes. Above 300 deg C, inorganic compounds formed by reaction with wire surface form chemical barriers. Electrodeposition of lubricant in experimental stage. Recent experiments with thicker films: increase from 0.0001 to 0.0005 in. using mineral oil reduced die wear by about ¼ of that with soap lubrication. High-speed tests in progress. If thick films feasible, die wear may become minor problem. 'Slip' method may be adopted with more wear-resistant materials for capstans. 1 table.

★ ★ ★

DRAWING ALUMINIUM

Anon. Wire Ind 1953 Vol 20 (239) p 1083 (Nov)

S American inquiry concerning tungsten carbide die design for aluminium drawing, dia at which diamond dies should be brought into use, and drawing cone angles. Reply that optimum carbide die design for aluminium has 25 deg angle, 30 to 40% parallel, 25 deg exist angle and bell-mouthed entrance. Diamond dies rarely used to draw dia exceeding 20 SWG, as stone liable to fracture under heavier circumferential pressure with thicker sizes. Drawing cone angles for diamond dies are 10 to 15 deg for



FACT: *in grinding carbides* — nothing cuts as fast, as cool and as economically as a diamond wheel.

FACT: *in drilling* — diamond bits give lowest cost per foot in hard geological formations.

FACT: *in dressing grinding wheels* only diamond dressers will do the job where fine finish, high production or intricate forms are involved.

FACT: *in wire drawing* — diamond dies assure accurate sizing, bright finish and high output.

FACT: *in lapping* — diamond compounds and powders save countless skilled man-hours by producing wanted sizes and finishes faster.

FACT: *in cutting* — diamond cutting and boring tools are standard for tough jobs where the best of competitive materials fail.

FACT: *in sawing* — diamond saw blades feature speed and economy on quartz, concrete, stone, sapphire, glass and diamond.

FACT: Diamond Tooling gives you precise production, more production, uninterrupted production, *lowest cost production*.

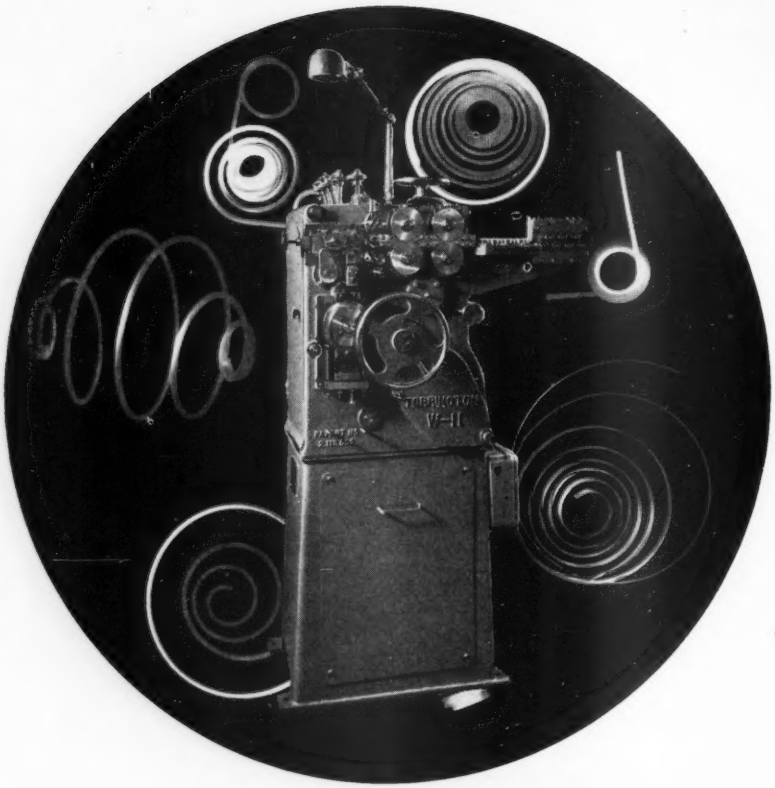
IT IS A FACT . . . THERE IS NO ECONOMIC SUBSTITUTE FOR DIAMONDS

News Note: there is not a shortage of industrial diamonds. Learn the detailed facts about this wonder material. Write today for specific information and free booklet, "The Diamond That Pays For Itself."

IDA — 75 MEMBER COMPANIES — Cooperating with Industry — INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, INC.

INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, Inc.

124 East 40th Street, New York 16, N. Y.



VERSATILE TORRINGTON SPRING COILER

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

SPECIFICATIONS
of the Model W-II Spring Coiler

The 14 different Torrington Spring Coilers cover a range of wire diameters from .003" to .750".

Wire diameter range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive.

Torsion and other attachments are available.

THE
TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

hardmetals, eg steel, 15 to 20 deg for copper and bronze, 20 to 25 deg for aluminium. Ten draft schedule for ⅜ in. aluminium rod given.

★ ★ ★

DIE-ANGLE SCOPE

Am Opt Co, Southbridge, Mass. Ind Diamond Rev 1954 Vol 14 (158) p 22 (Jan)
Instrument uses reflecting method after F. C. Elder, for determining angle of drawing dies by purely optical means. Detailed description of instrument. (1041).

★ ★ ★

BORE PROFILOMETER

S. S. Carlisle, R. B. Sims (BISRA). Instruments 1953 Vol 26 (12) pp 1882-1883, 1906 (Dec)
Description of several types of instruments used successfully for recording angle and profile of wire drawing dies. 6 illustra, 4 ref.

★ ★ ★

MODERN MULTIPLE WIRE DRAWING MACHINES

Niehoff KG, Schwabach, Germany. Draht 1953 Vol 4 (12) pp 468-469 (Dec) (In German)
Description of machines, in particular fine wire drawing machine for wires from 0.6 to 0.03 mm. Electric control starter gives drawing speeds between 6 and 25 m/sec; with reduced speed wires of 0.02 mm can be drawn. Machine has 2 pairs of drawing cones of wear-resistant chrome steel and can take 21 drawing dies on a movable well-cooled drawing die holder. Diagrams of range of machine. 4 illustr.

★ ★ ★

These abstracts were prepared by and are published through the courtesy of the Industrial Diamond Information Bureau, 34 Holborn Viaduct, London, E. C. 1, England. Inquiries regarding them should be directed to the Bureau.

Free World Nickel Production Expected To Increase

The further increase of 2,000,000 pounds monthly now achieved in the nickel production capacity of International Nickel, world's largest producer of the metal, and other expansion programs underway by other producers, indicate that free world nickel production should reach about 385,000,000 pounds in 1954. This would be an increase of approximately 45,000,000 pounds over the estimated production of 340,000,000 pounds in 1953.

Ruthenium

Ruthenium, first isolated a little over a century ago, was the last of the six precious metals in the platinum group to be discovered. The other five of this group are platinum, palladium, rhodium, iridium and osmium. All but osmium are used in jewelry.

New Motor of Advanced Design Announced

A completely new motor with numerous revolutionary features and conforming in every particular with NEMA specifications is announced by U. S. Electrical Motors Inc. By increasing precision of manufacture, holding tolerances to closer limits and improving the electrical characteristics, this new motor, designated as Uniclosed, Type H, is more compact than previous models. One outstanding feature is its complete drip-proof design without increased cost.

★ ★ ★

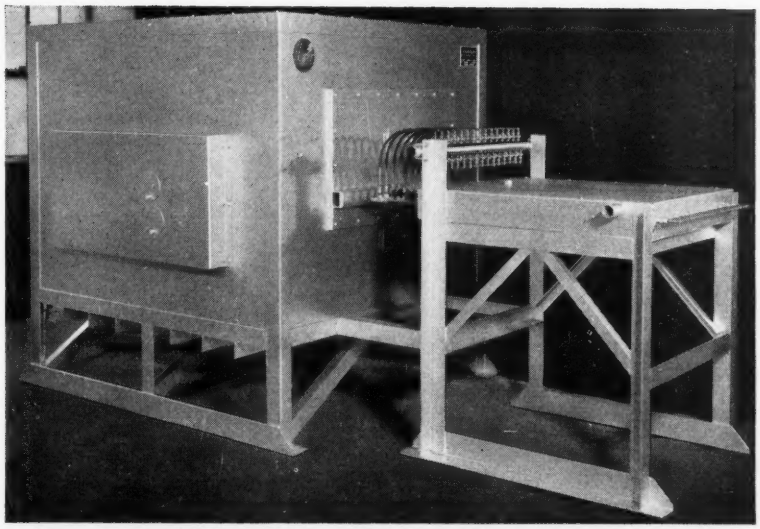
By utilizing the interior space to better advantage, the motor is built more compactly so that the same horsepower can be embodied in less space. The end brackets are of entirely new design with air intakes so arranged as to prevent intrusion of water, yet allow air flow into the motor for 2-way ventilation. Baffles of an entirely new design within the air vestibules of the end brackets prevent splashings from entering and coming in contact with the windings.

★ ★ ★

This new motor in its various sizes meets the same standards as its former type in temperature rise, torque, etc. Overload capacity has not been reduced. The slot design of the laminations has been improved and the asbestos-protected windings, an exclusive feature, have been reinforced and strengthened by the addition of Mylar laminations. Another desirable feature makes the leads more accessible. A stainless steel data plate set above the box presents a rustproof surface with legible instructions that can never be defaced. Lubri-flush lubrication of the bearings provides means of replacing old grease with new without the necessity of disassembling the motor or disturbing the bearings.

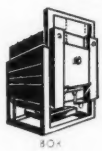
★ ★ ★

Literature describing Type H Uniclosed motor may be obtained from U. S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif.



Harper 30 Strand Wire Annealer . . . Models available for research and production

CONTINUOUS BRIGHT ANNEALING OF STAINLESS STEEL WIRE


BOX

with the modern

HARPER MULTIPLE STRAND WIRE ANNEALING FURNACE

Offers you these advantages

BELL

★ Continuous trouble-free round-the-clock production.

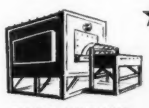
★ Wire is bright and clean upon leaving furnace, eliminating costly cleaning operation.

★ Uniform product, because of close control of temperature and protective atmosphere.

ELEVATOR

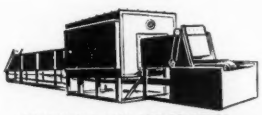
★ Spoilage is practically eliminated.

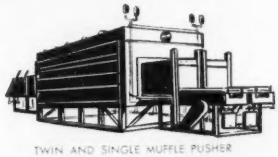
★ Savings in valuable floor space. The Harper multiple strand wire annealing furnace is a compact high production unit.


STRAND ANNEALING

★ Savings in man hours . . . only a mininum of operator attention is required.

Consider these important savings. They will soon pay for replacement of inefficient or outmoded equipment.


CONTINUOUS MESH BELT CONVEYOR


TWIN AND SINGLE MUFFLE PUSHER

Furnace Builders *for over 30 Years*

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Electric Furnace Corp.
42 RIVER ST., BUFFALO 2, N. Y.

The REEL News is that STEEL Costs Less!

Steel is **DURABLE**
Tests now being conducted indicate a life of 12 times that of wooden reels. Minimum maintenance.

Steel **COSTS LESS**
Although its cost initially is about 30% higher, its longer life results in at least a 400% saving.

Steel **PROTECTS**
The cost of a reel is infinitesimal compared to the value of cable it carries. Drop it, bounce it, handle it roughly. Steel stands up and protects your investment.

Steel is **RUGGED**
Steel reels do not warp, bulk less, carry more payload. Precision made, weatherproof, balanced.

NYECO REELS — SHIPPING REELS *(I-Beam or Channel)* — PROCESSING REELS *Heavy-Duty* — DRUMS and FLANGES *available separately*

Over 45 years of service in metal fabrications

NYECO

- Reels
- Tanks
- Vulcanizers
- Stands
- Caterpiller Take-Ups
- Cabling Machines
- Floor rolls
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YOUR INQUIRIES INVITED

NYECO is now furnishing Steel Reels to America's leading mills, including Phelps Dodge, Anaconda, General Cable, Roebling, Western Electric, Okonite. Without obligation, inquire for quotations on your specifications. Large plant, automatic production facilities, flexible set-up, with motor, rail, and water shipping facilities at the premises, insure accurate work, prompt deliveries, competitive prices, on large or small orders.

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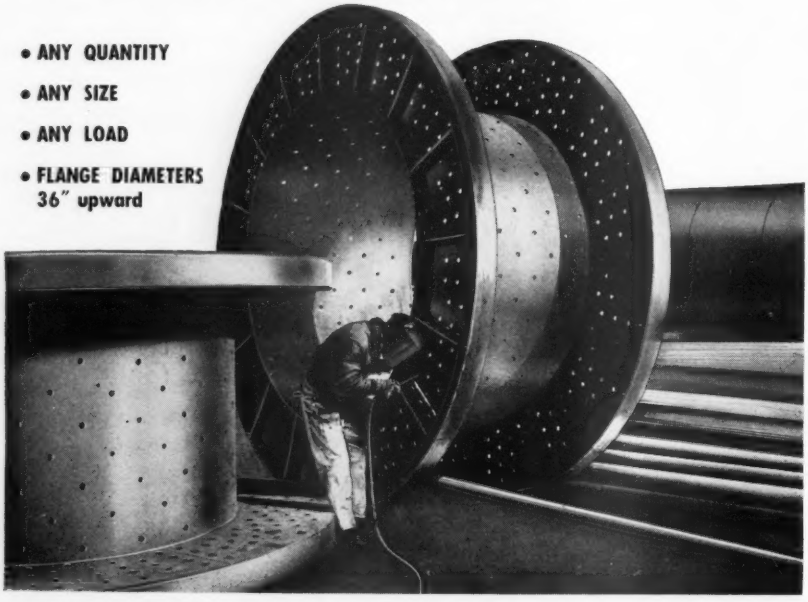
- **ANY QUANTITY**
- **ANY SIZE**
- **ANY LOAD**
- **FLANGE DIAMETERS 36" upward**



New Weatherproof Wire Has Outer Braid of Figerglas

A new type of Weatherproof Wire, in which the outer braid is glass yarn, has been announced by the **Rome Cable Corporation,** Rome, New York. It has a triple knit glass fibre cover and comes in sizes #14 through 4 AWG, put up in 500′ coil packages for wholesalers.

★ ★ ★

The glass outer braid is inherently resistant to moisture, heat, chemical action, and abrasion. Not only do the glass fibers resist the absorption of moisture, but they also do not serve as "channels" which conduct moisture beneath the surface, as organic fibers sometimes do. Laboratory tests have shown that the glass outer braid picks up as much as 50% less moisture than cotton-knit wire of the same type.

★ ★ ★

Glass yarns have a tensile strength several times higher than comparable organic fibers and retain that strength indefinitely. The fibers are not affected by oils and are resistant to most chemicals. This makes the braid an exceptionally durable support for asphalt coatings, and gives an especially valuable advantage in locations where chemical vapors are prevalent.

★ ★ ★

Because the glass is highly resistant to deterioration, the outer glass braid eliminates the unsightly festooning which commonly occurs in Weatherproof wire.

★ ★ ★

The application of glass braid to Weatherproof Wire is the culmination of several years of research conducted by the **Rome Cable Corporation** and the **Owens-Corning Fiberglas Corporation.** As a result of this research a special "Electrical Grade" of glass was developed, with exceptional weather-resistant properties.

No matter how much time you find to look for it, lost time is never found again.

Outstanding Personalities of the Wire Industry

Elected President of Gilbert & Bennett

John H. Mulliken was elected President of the **Gilbert & Bennett Manufacturing Company** at the regular monthly meeting of the Board of Directors on February 26th, to succeed the late **D. Henry Miller.** Mr. Mulliken was Vice President and Secretary. These additional changes in company officers were made at the same time for the following positions:

Raymond C. Miller—Vice President and Secretary
Ben Billinger—Vice President in Charge of Sales
Leonard Taylor—Assistant Treasurer
Ellen Berglund—Assistant Secretary

★ ★ ★

A. F. Warren was elected a Director to fill the unexpired term of the late Mr. Miller. Mr. Warren was formerly President of the Monowatt Corporation, a subsidiary of General Electric, at Providence, R. I., and is now associated with the Stamford Rolling Mills.

Firth Sterling Elects Director

Kenneth D. Mann, President of **Firth Sterling Inc.,** has announced the election of **Donald G. Clark** as a Director of the company.

★ ★ ★

Mr. Clark has been associated with the firm for a great many years in various capacities. He was a Vice President and a Director of Firth Sterling from 1928 to 1945 when he retired from active management. For the past few years he has served in a consulting capacity.

★ ★ ★

Prior to coming to Pittsburgh, Mr. Clark was Manager of the company's Eastern branch offices and at one time was a partner in the firm's Western sales agency.

Named Pennsalt District Supervisor

Charles R. Sorber, Jr., has recently been appointed Cincinnati District Supervisor for the Metal Processing Department of the **Pennsylvania Salt Manufacturing Company,** it was announced by **J. J. Duffy, Jr.,** Manager of this Department.

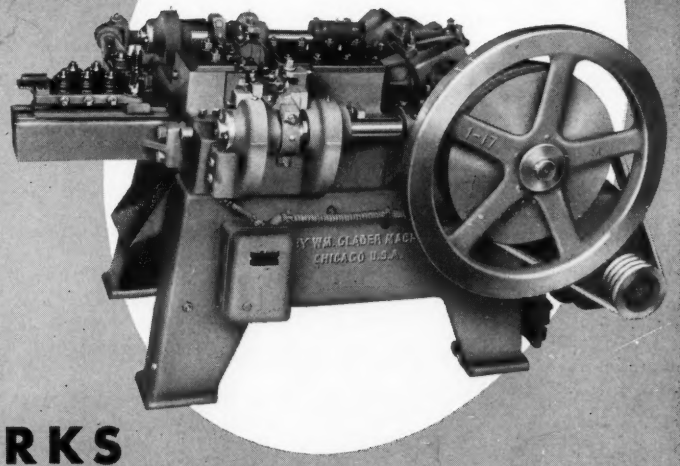
★ ★ ★

Mr. Sorber who served as sales representative in several territories, will make his headquarters in Cincinnati. He will supervise sales in the Indianapolis-Louisville, Columbus, and St. Louis territories covered by **A. S. Engle, J. O. Cram, Jr.,** and **F. E. Wilcher.**

★ ★ ★

This experienced team will sell and service the expanded Metal Processing line of products including cleaners, phosphate coatings and lubricants. Mr. Sorber is a graduate of Penn State College.

high efficiency — low cost
with GLADER wire nail machines



Eliminate costly down-time in the Nail Mill by replacing obsolete machines with new GLADER NAIL MACHINES . . . For tops in efficiency and economical operation use GLADERS.

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MACHINE WORKS

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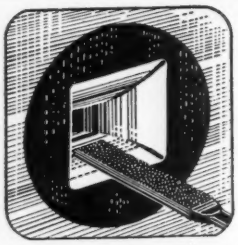
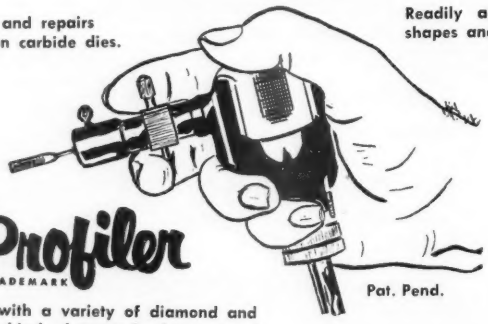


SPEED UP DIE REPAIR 50 TIMES

Makes and repairs tungsten carbide dies.

Readily adapts to special shapes and contours.



SHARPENS
GRINDS
FILES
SCRAPES
HONES
LAPS
SAWS
STONES
CUTS
FINISHES
POLISHES

the *Di-Profiler TRADEMARK

Pat. Pend.

is furnished with a variety of diamond and needle files, chisels, burs and other units of many intricate shapes, thereby reducing the tool and die maker's problem of special tools (made on your time) by 90%.

The *Di-Profiler can be used for repairing dies, even without removing from machine. You can hold your files absolutely level for straight holes and provide an oscillating motion for contour. The reciprocating action does the work at a stroke ranging from 0" to ¼", without vibration because of the high precision of the tool. Once you see it—you'll never be without the *Di-Profiler. Write for full details and ask for a demonstration.

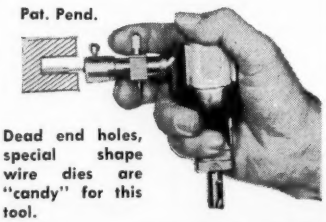
SAVE YOUR TOOL MAKERS AND MAINTENANCE MEN BY PROVIDING TOOLS TO DO THE HARD, TIRING PART OF THEIR WORK.

*DI-PROFILER ELIMINATES THE HARD "ELBOW GREASE" WORK.

Everything comes in an attractive mahogany finished box — except the flexible shaft, rotary attachment and motor.

See us at the Tool Show April 26-30, Booth No. 2059.

Pat. Pend.

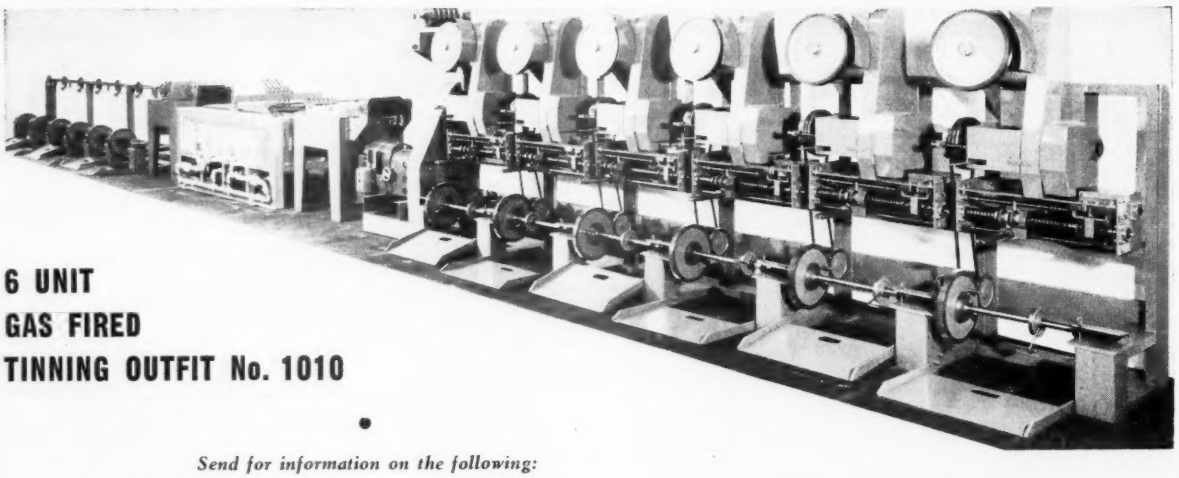


Dead end holes, special shape wire dies are "candy" for this tool.

Nord International Corp.

449-W CENTRAL AVENUE, ORANGE, NEW JERSEY

*An exclusive Nord Trade Mark



6 UNIT
GAS FIRED
TINNING OUTFIT No. 1010

•

Send for information on the following:

WIRE ANNEALING, TINNING and GALVANIZING OUTFITS

MULTIPLE or SINGLE UNIT WIRE TAKE-UPS

FINE WIRE DRAWING MACHINES

MAGNET WIRE ENAMELING EQUIPMENT, INCLUDING

PRE-ANNEALERS, SYNTHETIC ENAMEL APPLICATORS and CIRCULATING SYSTEMS

COTTON, GLASS-FIBRE and TAPE COVERING MACHINES

EST. 1855 AIMco INC. 1915

"American" AIM INSULATING MACHINERY COMPANY

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FAIRHILL AND HUNTINGDON STREETS

PHILADELPHIA 33 PENNSYLVANIA U.S.A.

Establishes Consulting Engineering Firm

The R. M. Reichl Company has been established, specializing in development-engineering, process-development and consulting, with offices at 110-11 Seventieth Road, Forest Hills, L. I., New York. The new company has been organized by **R. M. Reichl,** formerly Vice-President of **Hydropress, Inc.,** New York, who has been active in the field of heavy presses, extrusion, hydraulic machinery, pipe mills and rolling mills for over 20 years.

Warren Wire Appoints Sales Manager

The appointment of **Fabian W. Kunzelmann** as Sales Manager of the **Warren Wire Company,** Pownal, Vermont, was made on February 22nd by **John R. Cook,** President.

★ ★ ★

Prior to joining Warren Wire, Mr. Kunzelmann had been Manager of Manufacturer Sales for the **Phelps-Dodge Copper Products Corporation. Mr.** Kunzelmann comes to his new position with a background of over fifteen years in the copper industry.

★ ★ ★

The Warren Wire Company, manufacturers of copper wire products, has recently completed construction of new plant facilities which will greatly expand its capacity for the manufacture of its standard line of products in addition to its new high temperature wire, cables, and insulations.

Moore Given New Duties By Hooker

R. E. Wilkin, vice president and general sales manager of **Hooker Electrochemical Company,** Niagara Falls, announces that **John N. Moore** has been named Fluorolube sales supervisor, in addition to his duties as Virgo sales supervisor.

★ ★ ★

Hooker has a series of Fluorolube products which have unusual properties as special lubricants and sealants for use in equipment handling oxygen, hydrogen peroxide and other highly oxidizing and corrosive materials. Acceptance of these organic fluorinated materials is growing rapidly, the announcement stated.

★ ★ ★

Mr. Moore was graduated from Wesleyan University in 1941 with the degree of bachelor of arts in chemistry. He came directly to Hooker working in the manufacturing section of the research department. He was transferred to the sales department in 1949 where he was a Virgo sales supervisor in 1951. He is a member of the American Society of Metals and of **The Wire Association.**

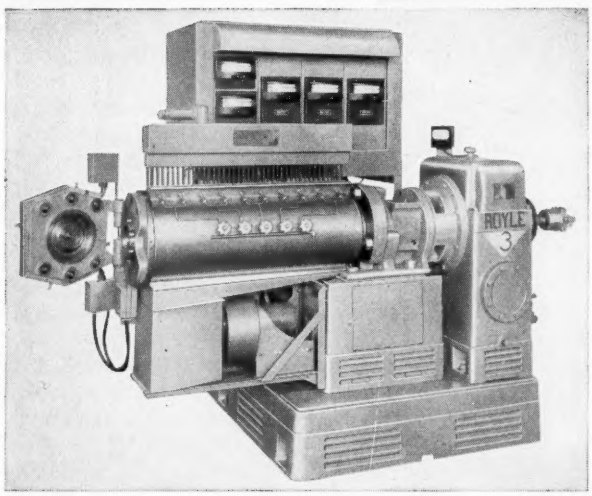
Riddle Advanced by CF & I

A. M. Riddle has been appointed executive assistant to the president of **The Colorado Fuel and Iron Corporation,** it was announced by **A. F. Franz,** president.

★ ★ ★

As manager of the corporation's

FASTEST HEATING FASTEST COOLING



Here are some of the time-tested, money-saving reasons more and more plants are standardizing with Royle Spirod* Extruders for processes requiring maximum flexibility in controlled temperatures — constantly maintained and accurately zoned:

- **Extra heavy walled cast steel cylinders that will not warp. No joints to leak when pressures are high or crevices to collect burned compound that would cause contamination.**
- **Heavy duty large diameter heating elements, that can be used with 440 volts without step-down transformers, provide radiant heat to cylinders and heads.**
- **Any heating element may be removed and replaced without disturbing other elements or wiring.**
- **A cooling system with ten times the capacity of conventional designs can be modulated through its entire temperature range without drastic changes. Ample cooling for all compounds at maximum speeds.**

No. 3 Royle Spirod Extruder. Completely insulated and equipped for evaporative cooling.

*Patent Applied For

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — REgent 2430

Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262

Akron, Ohio — J. C. Clinefelter — SWandale 4-5020

Los Angeles, Cal. — H. M. Royal, Inc. — LOgan 3261

PATERSON 3, NEW JERSEY

Market Research Department, a position he has held since 1942, Mr. Riddle has worked closely with administrative, sales, and operating personnel in the development of CF&I's broad program of expansion, modernization, and diversification. In addition to his new responsibilities, emphasis on new business development will be continued through market and economic research. His time will be divided between the western and eastern divisions of the corporation.

★ ★ ★

Mr. Riddle, who has more than thirty years' experience with CF&I, was first employed in the fuel division at the Segundo coke oven plant. He was later transferred to Pueblo, and in 1930 joined the president's staff in Denver.

Spring Machine Manufacturer Appoints Midwest Representative

The Torrington Manufacturing Co., producer of spring coiling machines, has announced the appointment of **William S. Doremus** as the spring machine division's Ohio Sales and Service Engineering representative with headquarters in Cleveland.

★ ★ ★

John C. Bate, spring machine sales manager, said that Mr. Doremus, a member of the Torrington staff since 1941, also will perform sales engineering assignments throughout the firm's Pittsburgh, Detroit, Chicago and central Canadian distribution areas.

★ ★ ★

Mr. Doremus, a native of Schenectady, N. Y., studied engineering at Union College and Rensselaer Polytechnic Institute. He joined The Torrington Manufacturing Co.'s engineering department in 1941 and was assigned to development and design of spring coiling machines. Mr. Doremus subsequently was named to operate the company's spring machine experimental research laboratory and in 1950 joined the firm's sales department to perform service engineering assignments in the field.

★ ★ ★

He will make his Cleveland headquarters at 4500 Euclid Avenue.

Firth Sterling Affiliate Elects Vice President

The election of **C. Paul Porterfield** as Vice President and General Manager of **The Method X Company,** an affiliate of **Firth Sterling Inc.,** Pittsburgh, has been announced by **Kenneth D. Mann,** President. Mr. Porterfield was previously Chief Engineer of The Method X Company, designers of electro-mechanical machining equipment.

★ ★ ★

Mr. Porterfield has had extensive experience in the field of electronics having served as electronic engineer for the Chesapeake & Ohio Railroad, chief engineer for Air Transport Maintenance Company, and radio engineer in the 7th Naval District in Miami.

★ ★ ★

He attended Northwest Missouri State Teachers College and the University of Miami, majoring in industrial engineering. He also attended Air Craft Radio Lab in Dayton, Ohio.

SCOVILL
MILL PRODUCTS
BRASS ★ BRONZE ★ NICKEL SILVER ★ ALUMINUM

ALWAYS CLOSE AT HAND

IT'S EASY TO SEE WHY "TOUGH-TO-MAKE" COLD-HEADED BRASS PRODUCTS CALL FOR
SCOVILL EXTRUDED
Cold-Heading Wire
(Cartridge Brass, 70%)

The availability of two closely controlled tempers makes possible more nearly perfect fabrication of cold-headed brass parts from wire of requisite "flow" characteristics (for heading and extruding), or of essential rigidity (for secondary machining). These two tempers are suitable for 99% of your cold-heading operations.

Scovill Extruded Cold-Heading Wire virtually eliminates—by reason of its higher copper content, production by the Hot Extrusion process, and closely controlled tempers—such defects (attributed to wire) as:

1. Split heads or shanks.
2. "Out-of-round" heads.
3. Inadequate filling out of heads and shoulders.
4. Rough "orange-peel" effect.

Let us help you select the proper applicable temper for A) HEADING and EXTRUDING, or B) HEADING and DRILLING. A trial run will convince you that there is an important difference in your products made from Scovill Extruded Cold-Heading Wire (Cartridge Brass, 70%).

You Can SELL the Difference

Write for full information to:

SCOVILL MANUFACTURING COMPANY

99 Mill Street, Waterbury 20, Connecticut, Waterbury 4-1171 10SC54B

James Day

It is with regret that the passing of **James Day,** founder and Managing Director of **James Day (Machinery) Ltd.,** London, England, is recorded. He died after a long illness on February 10, 1954.

* * *

Mr. Day founded the business in 1938 as the European representative of a number of American machinery manufacturers, including such leading concerns in the wire and cable industry as **American Insulating Machinery Company, Mossberg Pressed Steel Company, New England Butt Company, John Royle and Sons, Haskell-Dawes Machine Company** and **Industrial Ovens, Inc.**

* * *

Mr. Day was a well-known and popular personality in the wire and cable industry on both sides of the Atlantic. He frequently visited America, where he had many friends, and was a member of The Wire Association, the conventions of which he frequently attended. He was born in Lancashire.

* * *

The business will be carried on under the direction of A. J. Ensor, who had been Joint Managing Director of the company for some years with Mr. Day.

Reliance Electric to Expand Ashtabula Plant

The Reliance Electric and Engineering Company, Cleveland, Ohio, manufacturers of electric motors and power drives for industry, has placed contracts for a new plan addition to its Ashtabula (Ohio) Division, **J. W. Corey,** President of Reliance, has announced.

* * *

The building will be a single-story, 90,000 square-foot structure of steel, concrete and brick following the architectural lines and duplicating the manufacturing capacity of the Company's original Ashtabula Plant, completed in 1947.

* * *

The new plant will be used to produce the Company's new line of alternating current motors, built to recently-announced revisions in design standards of the National Electrical Manufacturers Association.

In New Sales Post with Pittsburgh Screw & Bolt

A. Barr Comstock, Jr., has been appointed general manager of sales for **Pittsburgh Screw and Bolt Corporation,** Pittsburgh, Pa.

* * *

He started with the company in 1946, and has been sales manager of the Philadelphia district since 1950. He will make his headquarters in Pittsburgh.

* * *

Charles H. Sutlive, who has been the company's sales manager in its Southeastern district, with headquarters in Savannah, Ga., will replace Mr. Comstock in Philadelphia.

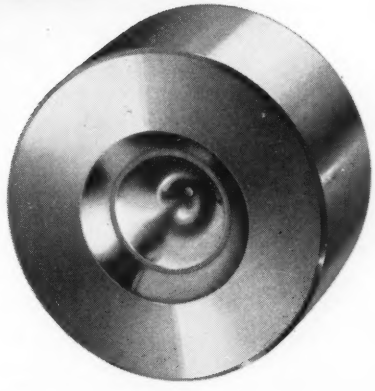
* * *

Directs Engineering for G.E.'s Silicone Products Department

The appointment of **Dr. Edward A. Kern** as Manager-Engineering for the **General Electric Company's** Silicone Products Department here

WILLEY'S
TUNGSTEN CARBIDE

METALS
DIES
TOOLS
for the Wire Industry



Rough Cored Standard Dies
(from stock)
ROUND SQUARE HEXAGON OCTAGON

Rough Cored or Finish Ground
(Immediate quotations on receipt of your prints—
Fast delivery schedules)

SPECIAL DIES WEAR PARTS MANDRILS
NIBS—HEADING AND EXTRUSION DIES

For complete information:

Willey's Carbide Tool Co.
1340 W. VERNOR HWY. • DETROIT 1, MICHIGAN

For Sale . . .

ONE—Hughesville 7 wire, 22" bobbin Strander Tube complete with cradles, etc. Condition new and unused.

ONE—Hughesville 6 wire, 13" bobbin, same as above.

Drive, haul-off and take-up for above machines can be furnished to customer's specifications.

For further information regarding prices and deliveries, write to

HMT — ESTABLISHED 1846 — WIRE & PROCESS MACHINERY

HUGHESVILLE MACHINE & TOOL CO.

54 W. Academy Street, Hughesville, Pa. Tel.: 129-A

Exclusive Representation in Canada by

THE LARSON COMPANY, TORONTO, CANADA

WAFIOS

WIRE-WORKING MACHINERY

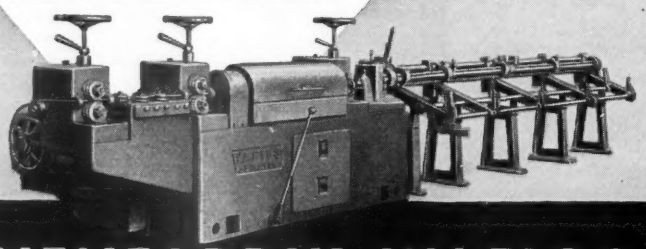
Wire Netting Machines for Chain Link, Hexagonal Mesh, Poultry Netting, Field Fence. Crimping, Barb Wire and Staple Machines. Spring Coilers. Spring End Grinding Automatics. Loop Benders. Upholstery Spring and Wire Mattress Machines. Wire Nail Machinery. Chain Formers. Chain Welders. Straightening and Cutting Machines. Multi-Slide Wire and Strip Forming Machines. Special Machinery for the making of Paper Clips, Lock Washers, Bale Ties, Key Rings, Tin Openers, Wire Bag Ties, etc. Automatics for Flexible Metallic Tubing.

Kurt Orban Company, Inc., 205 East 42nd St., New York 17, N. Y.

Sole Agents for Australia and New Zealand: Bliss & Reels Co. Pty. Ltd., 64-66 Little Bourke Street, Melbourne C. 1, Australia.

WAFIOS

SINCE 1893



MASCHINENFABRIK WAFIOS

WAGNER, FICKER & SCHMID **REUTLINGEN 3 / WÜRTT. GERMANY**

has been announced by department general manager **Dr. Charles E. Reed.** Dr. Kern will make his headquarters at G. E.'s silicone products plant in Waterford, N. Y.

★ ★ ★

Associated with laboratory research activities at G. E.'s Transformer Division in Pittsfield, Mass., since 1942, Dr. Kern will leave his present post as Manager—Materials and Processes Laboratory at the Pittsfield Works for his new Waterford, N. Y., assignment.

★ ★ ★

A native of Schenectady, N. Y., Dr. Kern was graduated from Union College with a B.S. in Chemistry and from Polytechnic Institute of Brooklyn with a Ph.D. in Physical Chemistry. He joined the G-E Works Laboratory staff at Pittsfield in 1942, and was promoted there to the post of section head in charge of insulation research. In 1952, he was named Manager of the Materials and Processes Laboratory, the position prior to his new appointment.

All West Wire Products Formed On Coast To Make Stitching Wire

All West Wire Products, the first Western firm devoted to the exclusive distribution of locally produced industrial stitching wire, has been formed, it has been announced by **C. T. Beall** and **P. F. O'Donnell,** principals of the new company.

★ ★ ★

The firm, with home offices in San Francisco, will handle the sale and distribution of stitching and other types of fine wires used by industry for stapling corrugated shipping cases. The company was organized to meet the growing demand for such wire products throughout the Western area.

★ ★ ★

To provide a steady, local source of supply, arrangements have been completed with **Sterling Edwards,** president, and **R. F. Hendrick,** vice president of the **E. H. Edwards Company,** to manufacture these wire products in their South San Francisco mill, and have installed the latest type of electronic flattening and spooling equipment for this operation.

★ ★ ★

Both Mr. Beall and Mr. O'Donnell bring wide experience in the distribution of wire products to the new company. Mr. Beall was formerly assistant sales manager with **Chicago Steel & Wire Company.** Mr. O'Donnell has assumed duties of president of All West Wire Products.

★ ★ ★

General office of All West Wire Products has been opened at 7 Front Street, San Francisco, Calif. Branch offices are being established in major cities of California, Arizona, Nevada, Utah, Oregon, Washington, and the Territory of Hawaii.

Nord Opens Plant in Orange, New Jersey

Nord International Corp. Denville, N. J. has opened a two story brick and stucco plant lo-

"KNOW PARKIN" is right!

When you Know Parkin you'll know the finest Pickling Compounds available anywhere!

NEP — SUM-FOAM — NEPTUNE
(Inhibitor) (Foamer) (Accelerator)

Parkin products are available in powdered and liquid form. Phone or write for a shipment today and begin getting better pickling at less cost right away.

You can save a lot of acid and a lot of metal by *controlling* your pickling operations with Parkin products.

Using Parkin products in the bath, you will cut down acid carry-over and dragout. You'll put an end to overpickling. You'll get faster, safer, cleaner pickling.

Your men will appreciate the change, too, because Parkin products act as a powerful deterrent to acid spray and fumes.

parkin CHEMICAL COMPANY
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PITTSBURGH 6, PENNA.

PICKLING SPECIALISTS
Parkin of Pittsburgh
IN STEEL SINCE 1860

cated at 449 Central Avenue Orange, N. J. where the main office will now be located in addition to the experimental and development departments.

★ ★ ★

Plans are also being made to concentrate service upon the full line of Nord Products at this location which will include repair of such items as Nord Nibblers, Di-Profilers, Nibblex units, cutters, dies, etc.

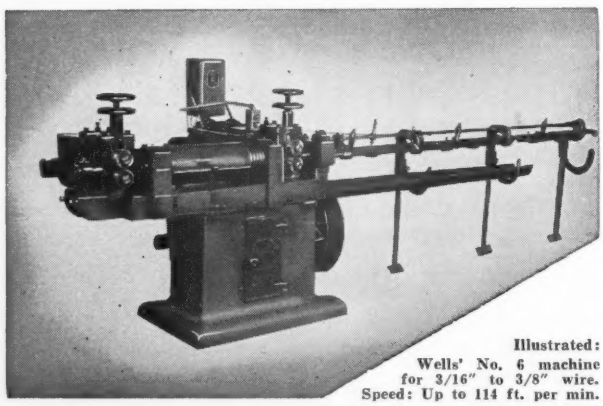
★ ★ ★

The President, **Harold Hedstrom,** announces that a substantial amount of additional machinery and production equipment has been installed so that all manufacturing can be supplemented, production methods determined and quality can be controlled to a greater degree, from this one point. He also states that a U. S. Patent has been granted on his sheet metal cutting tool designated as the NIBBLEX, which cuts sheet metal with an electric hand drill by a fast punch and die method that leaves no rough edges, nor distortion.

What do you want in your

STRAIGHTENER and CUTTER?

- **DEPENDABILITY?** **WELLS machines provide day-in, day-out continuous operating service.**
- **SPEED?** **These automatic rotary machines will not only give you speed, but accuracy as well.**



Illustrated: Wells' No. 6 machine for 3/16" to 3/8" wire. Speed: Up to 114 ft. per min.

Cuts wire in any length from 7½" up to 25'. Special attachment furnished on order for long lengths. Straightener flier runs in ball bearings. Gear drive and motor enclosed in base. Door provides accessibility.

58 years of experience and continuous engineering, with use of finest materials, have put WELLS machines in a class by themselves for excellence of performance. Built to handle the toughest jobs, year after year, with little or no servicing. Supplied in a complete range of sizes.

Send for Catalog covering the full line.

Frank L. Wells Company

KENOSHA • 5821 Fifth Avenue • WISCONSIN

Builders of Fine Wire Working Machinery

Plastics Sales Division Formed by Hooker

Formation of a plastics sales group by **Hooker Electrochemical Company,** Niagara Falls, has been announced by **Robert E. Wilkin,** vice president and general sales manager.

★ ★ ★

This new group, headed by **Charles Y. Cain** who has been promoted to manager, plastic sales, will handle sales of Hooker's new fire-resistant polyester resin named Hetron. Other members of the group are sales representatives **John P. Edwards, Carl I. Gochenour, Alexander L. Blackwell** and **Robert J. Entenman.**

Igoe Elects Vice President

Igoe Brothers, Inc. have announced the appointment of **Francis H. Davidson** as Vice President of their concern as well as Vice President of their subsidiary, **Taylor-Davis, Inc.** of Philadelphia, Pennsylvania. Mr. Davidson joined Igoe Brothers, Inc. in early 1952 as Manager of the Reinforcing Steel Division. Prior to that time he was associated with Jones and Laughlin Steel Corp., Pittsburgh, Pa.

Tyson Added to Board of CF&I

The stockholders of **The Colorado Fuel and Iron Corporation** voted at the Fall annual meeting to reelect all 11 members to the Board of Directors. The announcement was made by **Charles Allen, Jr.,** chairman of the board. In addition, the stockholders elected **Charles Roebling Tyson** a member of the board of directors.

★ ★ ★

Mr. Tyson, executive vice president of John A. Roebling's Sons Corporation, served as president of Roebling for five years prior to its acquisition by CF&I as a wholly-owned subsidiary on December 31, 1952.

★ ★ ★

CF&I, with 14 plants in seven states, has a rated ingot capacity of 2,466,000 tons a year, and manufactures a wide range of products for many of America's principal steel-consuming industries.

Re-elected President of Acheson Industries

Howard A. Acheson was recently re-elected president and chairman of the board of **Acheson Industries, Inc.** at its annual stockholders' meeting. Acheson Industries, Inc. includes Acheson Colloids Company, Port Huron, Mich., and Acheson Colloids Ltd., London, England, leading manufacturers of colloidal graphite dispersions, as well as Acheson Dispersed Pigments Company, Philadelphia, Pa., and Gredag, Inc., Niagara Falls, N. Y.

★ ★ ★

Also, at the meeting, the follow-appointments were announced: **Raymond Szymanowitz,** vice-president; **P. C. Buck,** vice-president; **M. W. Reynolds,** vice-president; and **John C. Sprague,** secretary-treasurer. **Mrs. Leatha Tuer** and **Lester H. Miller** were elected assistant secretary and assistant treasurer, respectively.

Firth Sterling Appoints Representative

Firth Sterling Inc. has appointed **Albert E. Boot** as Carbide Service Engineer in its Mid-Eastern District.

★ ★ ★

Born and educated in the Pittsburgh area, Mr. Boot's first position was with the Westinghouse Research Laboratory in research drafting and tool fixture and apparatus design. He then joined Carboloy for six years in the capacity of service work and distributor promotion. From there he became employed by Morse Twist Drill in service work for three years. Mr. Boot, in coming to Firth Sterling, resigned a position with Wendt-Sonis.

★ ★ ★

Mr. Boot is a member of the American Society of Tool Engineers, and resides in Philadelphia, Pennsylvania.

To Head Product Programming for Carboloy

Frank M. Mansfield III, formerly Detroit district engineer for Torrington Co., has joined **Carboloy Department** of General Electric Company, Detroit, as manager of product programming.

★ ★ ★

After 5 years in the Army Air Corps, Mr. Mansfield was released as a captain in 1946. He was graduated from Rennselaer Polytechnic Institute, Troy, N. Y. in June 1949 as a mechanical engineer.

Mr. Mansfield joined Torrington Co., Torrington, Conn., after graduation, and was district manager in Cincinnati from 1950 to 1953. He was transferred to Detroit as district engineer and later joined the Carboloy organization.

New District Manager at Seattle for Anaconda

Albert H. Leader has been appointed district manager for the Seattle office of **Anaconda Wire & Cable Co.** He succeeds **Lloyd Wolfe,** who retired on March 1st after 32 years of service with the company.

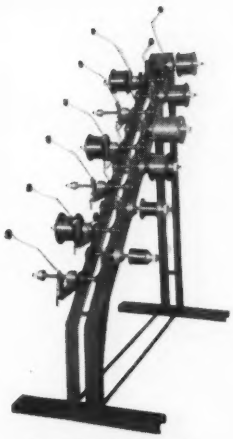
★ ★ ★

Mr. Leader is a graduate of the

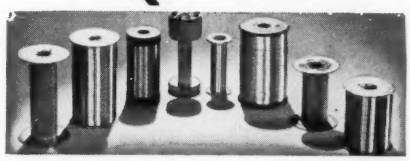
STANDARD UNI-DRIVE WIRE WINDER

INCREASE YOUR PRODUCTION WITH THIS WINDER

Wire Winder



Pay-off Attachment



Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAYOFF

Our payoff attachment is made with self-aligning ball bearings and a compensating attachment to control the tension of each end. Applies same tension when spool is empty as when full.

The new Uni-Drive Winder with Payoff Attachment is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel—no over or under-winding. Automatic Stop-Motion controls each strand. Compensating attachment produces perfectly controlled tension. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors up to ¾" diameter.
Payoff can be equipped with Carboloy Guide Inserts at additional cost.

STANDARD MILL SUPPLY COMPANY
PAWTUCKET, RHODE ISLAND, U.S.A.
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University of Washington, with a degree in Electrical Engineering. He joined Anaconda as a sales trainee and, in 1949, was assigned to Seattle as salesman. In 1950 he toured Alaska to survey, for the company, its possibilities for electrical development.

Bauer, Strohm, Torrace Elevated by Standard-Toch

In his annual message to stockholders **Milford H. Corbin,** president of Standard-Toch Chemicals, Inc., announced the election of **Carl Bauer** as executive vice-president of the company; **J. Robert Strohm** as vice-president to succeed Mr. Bauer in charge of industrial sales; **William G. Torrace** as vice-president and director, effective February 1.

* * *

Mr. Bauer joined Standard-Toch in 1942 as a chemical engineer and was made technical director in 1947. In 1949 he was elected vice-president in charge of industrial sales. A number of coatings and compounds widely used in the wire industry today were developed under his direction, including asbestos coating for wire of which his company is the leading producer.

* * *

Mr. Strohm came with Standard-Toch Chemicals in 1946 as plant engineer, after serving in technical and managerial capacities with several important concerns.

* * *

Mr. Torrace entered the company in 1953 as comptroller. He is a member of the American Institute of Accountants, New York State Society of Public Accountants and the National Association of Cost Accountants.

* * *

W. Burchard Day, who retires as chairman of the board of Standard-Toch Chemicals, Inc., was associated with the company, in various capacities, for forty-five years.

* * *

Australian Visits America

On September 17th last, **Geoffrey H. Henderson,** Assistant General Manager of **Lysaght Bros. & Co., Pty.** Ltd., Sydney, Australia left for a four month visit to England and America to study, among other things, wire drawing practices. He is the son of the late Edwin T. Henderson, who had been associated with **Broken Hill Proprietary Ltd.,** for many years.

* * *

Mr. Henderson joined B.H.P. in 1931 as a technical trainee at the Newcastle Steel Works. He is a metallurgist and has worked in various of B.H.P.'S plants, being given his present assignment three years ago.

* * *

Mr. Henderson attended the Annual Convention of the Wire Association last November in Chicago and will be pleasantly remembered by the many who made his acquaintance there.

Refinishing Wire Drawing Dies?

Save Money with NORBIDE® Abrasive . . .

Second in hardness only to diamond which costs a hundred times more

Johnson Steel & Wire Co., Inc. has substantially reduced the cost of refinishing their wire drawing dies by substituting NORBIDE Abrasive for costly diamond dust. Excellent for ripping or for fast stock removal as well as for accurate semi-finishing operations.

High accuracy is important to Johnson for Johnson "music" spring wire is drawn in 200 different sizes, all the way from .003" to .200".

If you are still using diamond dust for your ripping and semi-finishing operations, you'll be amazed at the savings you can obtain by switching to NORBIDE Abrasive.

For cost-cutting abrasive details, write for Form 559.

NORTON COMPANY

45 New Bond Street • Worcester 6, Massachusetts

NORTON

BORON CARBIDE

NORBIDE® . . . the hardest man-made abrasive

A Review of Recent Wire Patents

No. 2,668,186, ELECTRIC CABLE WITH OIL PRESSURE OUTSIDE THE INSULATION, patented February 2, 1954, by Louis Domenach and Louis Macardier, Lyon, France, assignors to Compagnie Generale d'Electricite, Paris, France, a corporation of France.

An oil filled electric cable of high voltage, subject to considerable variations of elevation, having wound paper insulation wound around the cable conductor and impregnated with a fluid impregnating oil is provided with an internal conducting membrane around the insulation and being impervious to the impregnating oil so impregnating the cable insulation, there are also an external electrically conducting pressure resisting envelope arranged surrounding and spaced from the membrane and forming an integral part of the cable, and a metallic reinforcing sheath mounted surrounding and in contact with the membrane, the channel space between the envelope and the membrane containing a pressure liquid.

★ ★ ★

No. 2,668,349, SPRING WINDING MACHINE, patented February 9, 1954, by William Darin, Lincoln Park, and Joseph J. Palid, Belleville, Mich., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware.

More specifically the invention resides in a movable clamp for supporting the spring in association with a carriage having a tube through which the springs are axially driven to effect their winding is laterally reciprocated to alternately position the tube in alignment with a spring feeding magazine and a spring driving ram respectively.

★ ★ ★

No. 2,668,590, FISHHOOK MAKING, patented February 9, 1954, by William J. De Witt and Herbert A. Corbett, Auburn, N. Y., assignors, by mesne assignments, to Auburn Fishhook Company, Inc., Auburn, N. Y., a corporation of New York.

Wire is intermittently fed past an operating station and blanks are successively severed from it by shearing along planes at right angles to and at an acute angle to the axis of the wire, to produce blanks having a pointed end.

★ ★ ★

No. 2,668,615, MEANS FOR SIMULTANEOUSLY FEEDING TWO WIRES, patented February 9, 1954, by Peter M. Sampatacos, Torrington, Conn., assignor to The Torrington Manufacturing Company, Torrington, Conn., a corporation of Connecticut.

A mechanism is provided for longitudinally feeding two separate straight contacting wires in two parallel paths which wires normally have equal diameters but are subject to slight variations from diameters equality.

★ ★ ★

No. 2,668,670, COIL WINDING MACHINE, patented February 9, 1954, by De Witt T. Van Alen, Delavan, Wis., assignor to The George W. Borg. Corporation, Delavan, Wis., a corporation of Delaware.

Included is a device for comparing the rate at which the resistance of the winding of the wire increases during the winding operation with a standard rate, and a second device controlled by the comparing device for automatically changing the spacing if the rate at which the resistance of the winding increases is too fast or too slow.

★ ★ ★

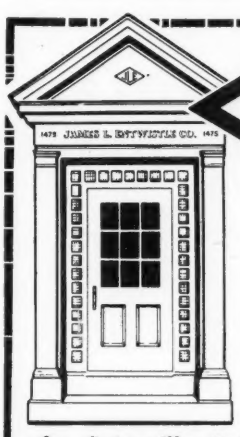
No. 2,668,966, METHOD OF MAKING SELF-LOCKING SCREWS HAVING MISMATCHED THREADED SECTIONS, patented February 16, 1954, by Webster D. Corlett, River Forest, and Charles G. Mackie, Chicago, Ill., assignors to Standard Screw Company, Hartford, Conn., a corporation of New Jersey.

A self-locking tappet adjusting screw is provided which will maintain a torque to turning maintained automatically during operation of the tappet.

★ ★ ★

No. 2,669,031, APPARATUS FOR DRYING A LIQUID COATING ON AN ELONGATED PRODUCT, patented February 16, 1954, by Charles R. Chase, Morrisville, Pa., and George L. Bliss, Cleveland, Ohio, assignors to United States Steel Corporation, a corporation of New Jersey.

Apparatus for treating wire or the like is disclosed comprising an elongated drying oven disposed vertically and having transverse entrance and exit slots in its bottom and top, respectively, and an opening in one side from top to bottom communicating with these slots and affording clearance between the wire



JLE

SERVING THE WIRE INDUSTRY THROUGHOUT THE WORLD

- Caterpillar Pull-outs
- Standard Sets of Spark-Testing Equipment
- Take-ups and Re-spoolers
- Reelers
- Coilers
- Spoolers
- Collapsible Coiling Reels
- Wire Sparkers and Accessories
- Hand Locators
- Electrode Units and Stands
- Measuring Machines, Counters and Accessories
- Wire Guide Units
- Pay-off Reels Stands
- Electronic Devices
- Shaftless Take-ups and Payoffs
- Wire Pre-Heater
- Disk Brakes and Controls, Drag Units and Slip Clutches
- Wire Marking Machines, Type Strips, Inks
- Labelling Machines
- Pneumatic Equipment and Controls
- Special Machinery for the Wire Industry
- Hydraulic Equipment and Controls
- Hi-Pot Test Sets
- Cable Handling Equipment for Warehouse Use

See Page 390 for News of JLE Automatic Re-Spooler

JLE JAMES L. ENTWISTLE CO. JLE

SALES OFFICE: 30 SOUTH BROADWAY, YONKERS, NEW YORK

PLANT and EXECUTIVE OFFICE: 1475 ELMWOOD AVE., CRANSTON (PROV. 7), R.I., U.S.A.

European & South American Agents: M. CASTELLVI, INC., 150 BROADWAY, NEW YORK 38, NEW YORK

British Associate: GENERAL ENGINEERING CO., LTD., BURY ROAD, RADCLIFFE, LANCS., ENGLAND

Asiatic Agent: OKURA & COMPANY, 30 CHURCH ST., NEW YORK 7, NEW YORK

and oven on sidewise movement of the latter, brackets extending from the sides adjacent that having the opening and overhead trolleys secured to the brackets supporting the oven for sidewise movement along the line of said slots.

★ ★ ★

No. 2,669,102, EAR ORNAMENT, patented February 16, 1954, by Ruth Mary Ronstadt, Tucson, Ariz.

This ornament comprises a single length of wire wound into a pair of flat pads.

★ ★ ★

No. 2,669,239, FLEXIBLE HAIR RETAINER, patented February 16, 1954, by Roy A. Smith, New York, N. Y., assignor, by mesne assignments, to Featherombs, Inc., a corporation of New York.

The retainer comprises an integral length of wire formed into a number of bowshaped toothlike elements.

★ ★ ★

No. 2,669,291, CUSHION CONSTRUCTION, patented February 16, 1954, by Alfred C. Hoven, and Walter E. Nordmark, Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich., a corporation of New Jersey.

Included are a number of sinuous spring wire elements spanning the foundation from side to side and a resilient border wire extending peripherally around the interior of the cushion at a higher level than the spring elements.

★ ★ ★

No. 2,669,292, SPRING CUSHION ASSEMBLY, patented February 16, 1954, by Vito Asaro and Edward P. Krajewski, Detroit, Mich., assignors to L. A. Young Spring & Wire Corporation, Detroit, Mich.

There are ten claims to this assembly which includes a number of outwardly bowed special main and supplemental spring units, each comprising strands of wire having longitudinally spaced oppositely disposed loops therein of substantial length extending transversely of the length of the unit and having reaches between the loops disposed lengthwise of the unit in side by side relation, the ends of the strands terminating in opposed laterally extending fingers.

★ ★ ★

No. 2,669,293, WIRE SPRING AND WIRE SPRING STRUCTURE, patented February 16, 1954, by William H. Neely, Cleveland, and William C. Sandor, Solon, Ohio, assignors to The Universal Wire Spring Company, Bedford, Ohio, a corporation of Ohio.

In this wire spring structure a wire supporting rod and a sinuously corrugated, flat, wire spring member removably, non-rotatably coupled with and supported by the wire supporting rod are provided.

★ ★ ★

No. 2,669,407, BABY BOTTLE HOLDER, patented February 16, 1954, by Donald A. Roselle, Racine, Wis.

The holder comprises a single piece of spring metal wire.

★ ★ ★

No. 2,669,754, MANUFACTURE OF COMPOSITE WIRE AND ROPE, patented February 23, 1954, by Joseph H. Chadbourne, Danielson, Conn., assignor to The Danielson Manufacturing Company, a corporation of Connecticut.

This patent covers the steps of drawing a core at high speed through an extruding die having a flow chamber with a narrowing restricted orifice and extending a thermoplastic material of the amido polymer type heated to the plastic state around the core and in contact with it, as it passes from the die to form a surfacing therefor, the speed of the core through the die being greater than the speed of flow of the thermoplastic material through the die to stretch the material by the rapidly moving core while the material is still in a plastic state, whereby a lock bond between the surfacing and the core results.

★ ★ ★

No. 2,670,024, TIRE FOR USE ON ICE, patentetd February 23, 1954, by John O. Antonson, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N. Y., a corporation of New York.

A traction element moldable in the tread rubber material of a vehicle tire is provided comprising a length of wire bent in sinuous form thereby providing leg portions connected alternately by loop portions, said sinuous length of wire itself being additionally bent back and forth in a single plane to form a row of lengths of wire each length having a number of sinuosities.

★ ★ ★

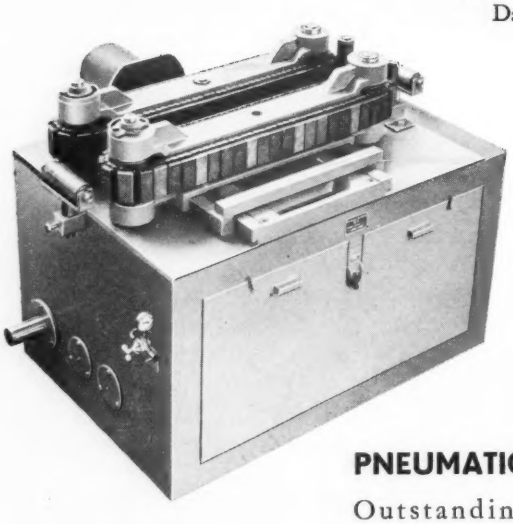
No. 2,670,165, BOTTLE HOLDER, patented February 23, 1954, by Richard A. Dominguez, Richmond, Calif.

The holder comprises an elongated wire bent to provide a bracket and a support.

★ ★ ★

CATERPILLAR DRAW-OFF

No Bending of the Cable.
Very Easy Operation.
Reduced Floor Space.
No Friction;Does Not
Damage the Cable.



PNEUMATIC CONTROL

Outstanding Features:

Adjustable Pressure Against the Cable. INDEPENDENT of Cable Diameter ● The Diameter of the Cable can VARY Steadily, without Inconvenience ● Opening and Closing by Finger-Tip Control;

Pat. pend.

MAILLEFER S.A.

RENENS-LAUSANNE (SWITZERLAND)

MACHINERY FOR THE WIRE INDUSTRY

For the U.S.A. enquire to : J. L. Entwistle Company, Providence. R. I.

Titanium Prices Reduced

Rem-Cru Titanium, Inc., Oliver Bldg., Pittsburgh, 30, Pa., has announced its third price reduction on titanium, due to higher production and improved processing. New prices became effective on February 19th.

★ ★ ★

Base prices on billets and bars have been reduced 14% to $9.00 a pound, with bars under 1/2" dropping to $12.00 per pound for 10,000 pounds or more. Narrow strip and wire prices will be released at a later date.

I.D.A. to Exhibit at A.S.T.E. Tool Show

The Industrial Diamond Association of America, 124 E. 40th St., New York 16, N. Y. of which **Athos D. Leveridge** is Executive Manager, is participating with an exhibit at the forthcoming Tool Show of the A.S.T.E. in Philadelphia on April 26-30.

★ ★ ★

The exhibit will include diamond wire drawing dies, diamond powders and compounds diamond saws, industrial diamonds as mined and will include a processing demonstration.

★ ★ ★

The demonstration will cover also the use and care of diamond tools and a booklet, "The Diamond That Pays for Itself" will be distributed to interested persons in attendance at the show.

Bulletin Describes New Heat Exchanger

Carl Buck and Associates, Essex Falls, N. J., have brought out a new line of heat exchangers of simple and efficient design, made of such materials as Tantalum, stainless steel, Karbate and black iron in the heat exchanger tube.

★ ★ ★

One of these, made of tantalum, is equipped with plastic spool pieces of Polycam at the ends, in order to handle chromic acid. Other materials used are appropriate to the handling of other acids.

★ ★ ★

A bulletin illustrating and describing the standard units are available upon request.

Folder Describes Work in Developing Future Scientists

The Future Scientists of America of the National Science Teachers Association, 1201 16th Street, N. W., Washington 6, D. C., has issued a folder describing the purposes of the Foundation, which are two:

★ ★ ★

1. **To help all high school students understand the basic principles of science, engineering and technology; and**
2. **To help able youths to become interested in and to prepare for careers in these fields.**

★ ★ ★

The Foundation is an activity of the N.S.T.A., which is a department of the National Education Association, a body chartered by Congress as a scientific and educational organization. The incorporation of the parent association applies to all departments.

★ ★ ★

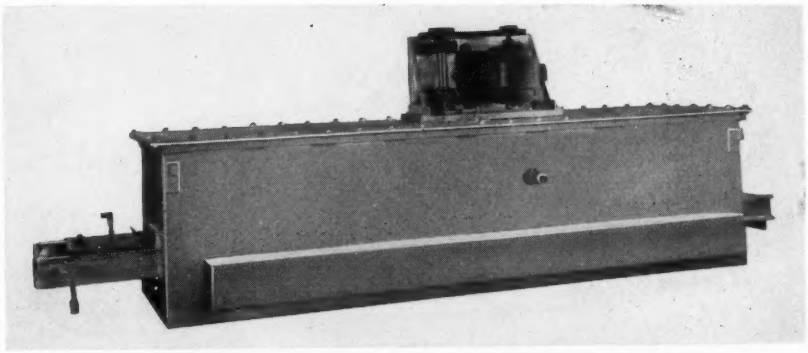
Concerns interested in furthering the good work of the Association by helping these young people to secure summer jobs are invited to send to the Foundation for a copy of the folder.

ROCKWELL BUILDS

Complete Processing Equipment for Magnet Wire

ENAMELING • TINNING

GLASS COATING • SYNTHETIC COATINGS



Rockwell continuous, recirculating oven for annealing 16 lines of wire in protective atmosphere. Part of a complete wire enameling installation. Can be used for copper, brass and steel wire at temperatures to 1200°F.

Also continuous annealing or hardening lines for all types of ferrous and non-ferrous wires.

We Invite Your Inquiries

We are pleased to announce that the wire processing equipment division is under the direction of Mr. O. S. Haskell.

W. S. ROCKWELL COMPANY

ROCKWELL SINCE 1888 BUILT

FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY

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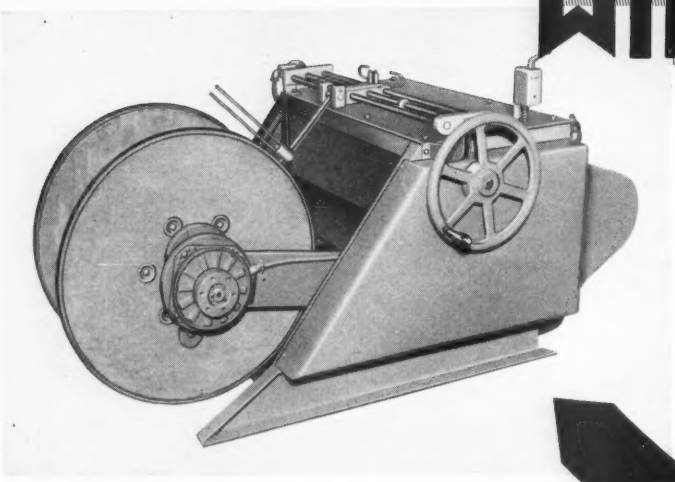
Sales Representatives in Principal Cities

WIM Shaftless

TAKE-UP STAND



WIM equipment is designed for faster more efficient wire handling. This high speed machine will handle the most exacting assignment with complete ease and dependability under the most severe production conditions. Write today for further information. Our engineering staff, experienced in the wire handling machinery field, will be glad to help you with your special problems.

Engineered to save you time, money, and effort, the Shaftless Constant Tension Take-up Stand is one example of WIM wire handling equipment.

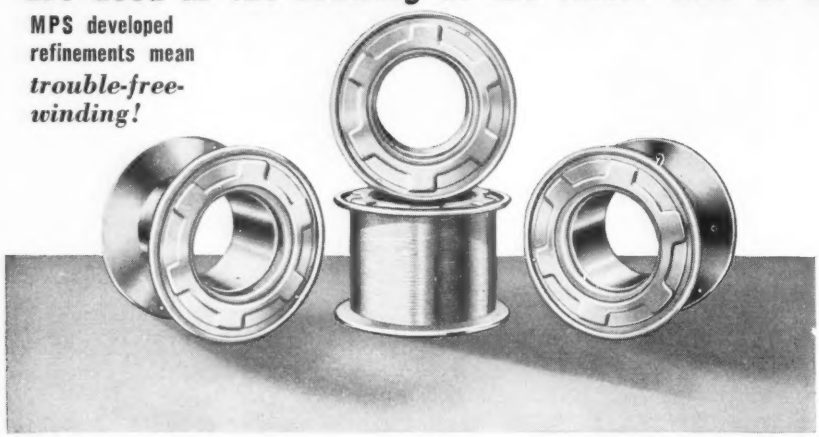
WIRE INSULATING MACHINERY, INC.

Division of Machinery Electrification, Inc.

Northboro Mass., U.S.A.

Spool Headaches Eliminated when MPS HEAVY DUTY NO-CREV SPOOLS are used in the drawing of the finest wire at high speed

MPS developed refinements mean *trouble-free-winding!*



SIZES

* 6	x 3½ x 3½
6	x 6 x 3½
6½	x 3½ x 3½
6½	x 6 x 3½
8	x 6 x 4½
8	x 8½ x 4½

and others

* Illustrated

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James Day (Machinery), Ltd., 28 Maddox Street, London, W. 1. England

Telephone Attleboro 1-0848

#104

Porter Announces New Cutter Series

In response to the on-the-job demand for heavy duty portable cutters by steel mills and construction companies, H. K. Porter engineers have developed an all-steel tool with heat-treated tubular steel handles built to stand up under the heaviest usage. Construction companies have particularly felt the need for cutters sufficiently rugged for continuous cutting of hard concrete reinforcing rods up to ½" diameter and wire rope and cable up to ¾" diameter. Models also available for cutting soft bolts, medium hard rods, etc. **H. K. Porter, Inc.,** Somerville, Mass., advise that detailed information on the new No. 5 Cutter is available.

Swaging Hammer Useful in Forming Brazed Joints in Electric Cable

A new use for a riveting hammer manufactured by **The High Speed Hammer Co., Inc.,** 313 Norton St., Rochester 21, N. Y., has met with enthusiastic endorsement of electric wire manufacturers in producing highly uniform joints on wires that have been butt-brazed. The excess silver solder and the joint are swaged to proper size by the hammer.

★ ★ ★

The hammer replaces a grinding operation, taking less time and doing a more accurate job by striking a series of 3200 blows per minute, which actually flows the metal to the diameter desired.

★ ★ ★

The machine being used in this manner is the company's Model No. 1AA, which comes for bench or pedestal mounting, complete with a ¼ H.P. 110 volt single phase motor. The bench model sells for $308.00 and the pedestal mounted model for $328.00, F.O.B. plant.

★ ★ ★

The company also makes a high-speed stripper, equipped with a three bladed cutter that tends to center the wire and twist it in the direction of lay. This stripper will remove insulation completely from solid or multi stranded cable up to ½" in diameter. It sells for $132.50 F.O.B. plant.

★ ★ ★

Full details on either or both of the machines may be secured by writing the company.

Vertical Type Muffle Furnace

The ATMOTROL vertical type muffle furnaces are described in a new bulletin just released by **Surface Combustion Corporation**, Toledo, Ohio.

★ ★ ★

Bulletin SC-165 includes a detail construction drawing, depicting important design features, photographs of typical applications with types of parts being heat treated, and descriptions of accompanying equipment—controlled cooling pits and prepared atmosphere generators. Handy engineering data and charts on the application of RX atmospheres to heat treat processing are also included.

★ ★ ★

Write direct to Surface Combustion Corporation, Toledo 1, Ohio for copies.

A WET-DRAWING PROBLEM THAT'S SIMPLER THAN A-B-C!

If you are wet-drawing non-ferrous metals, you'll find that Nopco DURPONS provide optimum performance for *twice as long* as conventional wire-drawing compounds. Yet they cost you no more.

There are two sound reasons for this profitable performance: All Durpon compounds contain (1) a buffer, to maintain the pH level, keep the emulsion from breaking; (2) a special sequestering agent, which holds the metal particles away from the effective drawing ingredients, *keeps the bath clean.*

Try some of these high-performance wire-drawing compounds today. You won't need anything more complicated than a slate to keep your comparative records. And you'll come out way ahead!

"Stay Stable Longer"

DURPON—for intermediate gauge wire

DURPON L—for heavy wire, rods, and tubes

DURPON FW—for fine wire

Mail coupon for technical bulletin and free trial sample.

*Reg. U. S. Pat. Off.

NOPCO
EVOLVED THRU RESEARCH

NOPCO
CHEMICAL COMPANY
Harrison, New Jersey
Cedartown, Ga. • Richmond, Calif.

NOPCO CHEMICAL COMPANY, Harrison, N. J.
Gentlemen: Please send me a copy of your technical bulletin and a free trial sample of: DURPON ___.
DURPON L ___ DURPON FW ___
NAME_____TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ZONE___STATE_____

COMING — A GOOD PACIFIC COAST MEETING
OF THE WIRE ASSOCIATION

THE TIME: Friday, June 11, 1954. The program will occupy the entire day.
THE PLACE: The new Statler Hotel in Los Angeles, California.

There will be a plant inspection trip, with dinner in the evening, followed by a technical session with two interesting papers.

Your Program Committee urges all men interested in the problems of wire production to make plans now to attend this annual Pacific Coast gathering. Full program details will be provided shortly.

THE PROGRAM COMMITTEE

Chairman

EARL R. POTTER, Pres., Industrial Wire Products, Inc., Los Angeles, Cal.

Members

P. J. SIEMONOSA, Asst. Treas.
Planett Mfg. Co., Downey

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U. S. Steel Corp., Los Angeles

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Steel Corp., Los Angeles

HAROLD HANSEN, Manager
Colorado Fuel & Iron Corp., Los Angeles

J. W. EGAN, Sales Eng.
Bethlehem Pacific Coast
Steel Corp., Los Angeles

Mr. Siemonosa will preside as chairman of the evening session.

J. F. CONLON, Controller
Davis Wire & Cable Corp., Los Angeles

A. A. OLSON, Supt. Wire Mill
Bethlehem Pacific Coast
Steel Corp., Los Angeles

RAY D. MACK, Manager
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Electric Co., Huntington Park

THE BEST FOR COVERING...

The **POURTIER** High-Speed
INDIVIDUAL INSULATING MACHINES

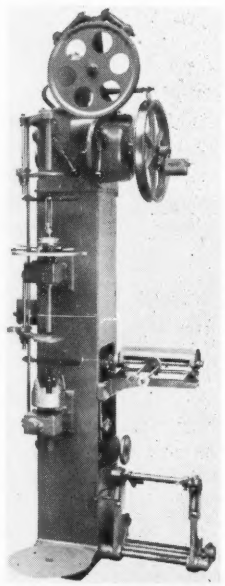
INDIVIDUAL HEAD, handling wire sizes of 7 to 32 A.W.G. Other models made with up to four (4) serving bowls.

POURTIER MACHINES will serve cotton, paper, cambric, fiberglas, silk, nylon and cellulose acetate at speeds of 4500 r.p.m.

EQUIPPED WITH:
8 speeds gear box for the haul-off capstan, automatic central lubrication and slow starting mechanism. Speeds easily changed. Bowls with compensator controlling the unrolling of the bobbin and a quick stopping device, in case of breakage of insulating material. Special control to change the direction of the heads. Traverse motion's speed and displacement easy to set up.

Machines are built to meet AMERICAN STANDARDS

SHORT DELIVERIES — LOW PRICES



INSULATING MACHINE 1M 402

POURTIER MACHINES
153 RUE GALLIENI, ROMAINVILLE-SEINE, FRANCE

Compounding of Electrical Grade Silicone Rubber

(*Continued from page 406*)

clays with a pH below 7 and a moisture content of less than 1% are acceptable. In Table VI the effect of cure with lower water absorption fillers is tabulated. It is evident that 1 hour at 300°F. is sufficient for both these compounds. However, since these data were obtained on pressed slabs in a small ventilated oven with free access of air to both sides of the slabs, the results may not be applicable to tight coils of wire on reels.

★ ★ ★

This discussion brings us abreast of current developments in silicone rubber compounding. There remains a few words that should be mentioned, namely, what we can look to in the future. It will not have escaped your notice that the so called fumed silicas and certain of the precipitated silica show great promise. They exhibit a high degree of reinforcement and it is possible to prepare them with very low water absorption. None of the synthetic silicas

TABLE VI - FIG. 8

Effect of Cure on % pf

	Compound I Diatomaceous Earth 40 vol.		Compound II Kaolin 40 vol.	
Hours at 300°F.	Initial	7 Days in 70°C. water	Initial	7 Days in water at 70°C.
1	.81	1.04	.29	.35
4	.82	1.02	.29	.44
8	.80	.95	.29	.47
24	.80	.92	.31	.42
96	.79	.91	.33	.36
168	.81	.89	.35	.36

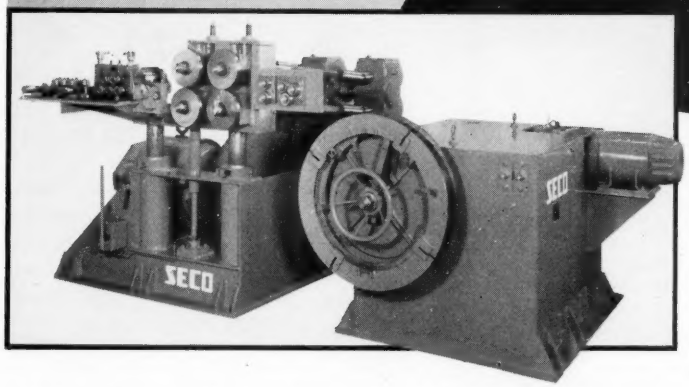
Effect of Cure on dK

	Compound I		Compound II	
Hours at 300°F.				
1	3.25	3.46	3.24	3.10
4	3.18	3.45	3.28	3.34
8	3.25	3.51	3.27	3.45
24	3.20	3.45	3.14	3.41
96	3.11	3.34	3.27	3.43
168	3.19	3.39	3.19	3.54

Outstanding Features Superior Performance

NEW Heavy Duty COILER for Electrode Wire

DOES ALL THESE OPERATIONS



1 - STRAIGHTENS 2 - MEASURES
3 - FEEDS 4 - PRECASTS 5 - COILS

This Coiler handles welding wire of 3/32" to 3/8" diameter at 200 to 800 F.P.M. on blocks of 12" to 25" diameter.

Mechanically it consists of two separate units: the first doing the straightening, measuring, feeding and pre-casting of the wire, the second doing the coiling only.

Electrically both units are tied together in as much as all motors are controlled from one VS drive and control unit.

Write for full information and data—or consult our engineers on your coiling problems—no obligation.

- Puts a predetermined cast in the wire prior to its coiling on the block.
- Makes a traverse wound coil which will easily uncoil although being close and tightly wound with no danger of springing open.
- First unit equipped for hydraulically raising or lowering the entire roll assembly for proper lineup with the block diameter.
- Complete control over traverse mechanism for delaying reversal at stroke ends.
- Compact construction with easy accessibility to all moving parts.

STEEL EQUIPMENT CO. 20805 AURORA ROAD CLEVELAND 22, OHIO

SECO

is quite as stable in water immersion tests as the naturally occurring diatomaceous earths, but immense strides have been made in this direction in a remarkably short period of time. Further progress will have to await developments by the silica producers. With the fumed silicas it is not difficult to imagine an expanding technology similar to that which has occurred in the carbon black industry. The same may very well be true for the fumed aluminas.

★ ★ ★

If these two "hopes" mature it is not difficult to design a compound with tensiles in excess of 1500 pounds, elongation in excess of 600 after prolonged heat aging and remarkably stable electrical properties comparable to the best organic rubbers of today.

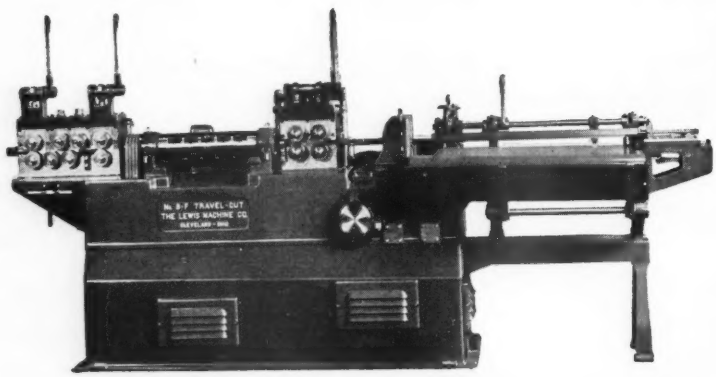
Summary

Fillers for an electrical grade silicone rubber are evaluated with regard to electrical properties, dielectric constant, and % power factor. Stability in water soaks are correlated with the water absorption of the compound, as measured by mechanical pick up, and the importance of low water absorption fillers stressed.

Fast, Accurate, Economical

STRAIGHTENING and CUTTING

with LEWIS TRAVEL-CUT



22 Models to handle from .012" to ¾" Round, Hex, Flat, Shapes.

Simple in design, rigid in construction, Lewis TRAVEL-CUT will deliver continuous dependable service under the most severe, high production conditions—day in, day out. Feeds wire from the coil, straightens accurately, gauges to uniform length, and cuts clean without stopping the wire. For steel, brass, aluminum and alloy wire. Cut your cutting costs with the Lewis TRAVEL CUT. Full details on request.

Exclusive Representatives

EAST: Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

MIDDLE WEST: Steel & Wire Machinery Co., 15457 Euclid Ave., Cleveland 12, O.

CENTRAL: Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California.

CANADIAN: Empire Engineering Co., 738 Dundas St., East, Toronto, Ont., Canada

CONTINENTAL EUROPE: Gaston E. Marbaix Ltd., Devonshire House Vicarage Crescent, London S. W. 11, England.

The LEWIS MACHINE Company

3441 E. 76th Street, Cleveland 27, Ohio

Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne

New Induction Unit for Bonding Ends of Multi-Strand Cable

Lepel High Frequency Laboratories, Inc. 55th Street & 37th Avenue, Woodside, New York City, has developed a tube operated induction heating unit to bond together the individual strands of multi-strand wire and cable thereby preventing the ends from becoming frayed or loose. This process eliminates the necessity of tin-dipping the ends after cutting and stripping.

★ ★ ★

According to **Henry Petersen,** President of the company, this low cost portable unit will effect tremendous savings in the wiring departments of radio, television, electrical apparatus and appliance manufacturers or any company having wiring assembly lines.

★ ★ ★

This highly versatile unit is used in conjunction with an automatic wire cutting and stripping machine by Federal Telephone and Radio Corp. When used in this manner, the wire is fed continuously through the load coil of the generator and the heating cycle is synchronized with the stroke of the wire cutter. The wire is heated and bonded at successive points where the subsequent cutting and stripping operations occur.

★ ★ ★

The unit is also ideally suited for heat treating thin parts such as surgical needles, dental burrs, localized annealing of spring wire and joining various types of wire products.

★ ★ ★

The Lepel model T-1-W operates on 115 volts single phase and contains a stepless power control to easily select the proper power output for heating various sizes of wire.

Bulletin Describes Corrosion and Abrasion Resistant Chains

A new bulletin describing Rex Z-Metal Chain is now available from **Chain Belt Company,** Milwaukee 1, Wisconsin.

★ ★ ★

Rex Z-Metal Chain is made of special heat-treated, alloyed furous metal. It has physical properties equal to the better grades of steel, yet is reasonably low in cost. It resists corrosion and abrasion and is considerably harder than malleable iron. It is unusually ductile and is readily machinable. Pins of Rex Z-Metal Chain are of heat-treated high-carbon steel.

★ ★ ★

The bulletin describes the user benefits of Rex Z-Metal Chain. Reports of laboratory tests and field applications are included, together with a pictorial presentation of available types.

★ ★ ★

Chain Belt Company is one of the leading manufacturers of sprocket chains and power transmission machinery, conveyors and process equipment and construction machinery.

★ ★ ★

For a copy, write Chain Belt Company, Dept. P.R., Milwaukee 1, Wisconsin, asking for Bulletin 53-56.

New Induction Heating Unit Announced

A redesigned 5 KW output high frequency induction heating unit (Model LI-5A-1) is offered by **Lindberg Engineering Company,** 2450 W. Hubbard St., Chicago, Ill., for soldering, brazing and light heat treating applications.

★ ★ ★

Lindberg's exclusive "Checklite" system of indicating lamps have been relocated to the cabinet front for easier observation and convenience. These externally located lamps instantaneously reveal any abnormal operating conditions at any of the many protective devices.

★ ★ ★

The temperature controlled water cooling system has been redesigned to reduce water consumption and to eliminate any possibility of moisture condensation on internal components and work coils. The non-ferrous cooling system incorporates molded porcelain water coils to form insulating water columns eliminating rubber or organic type hose.

★ ★ ★

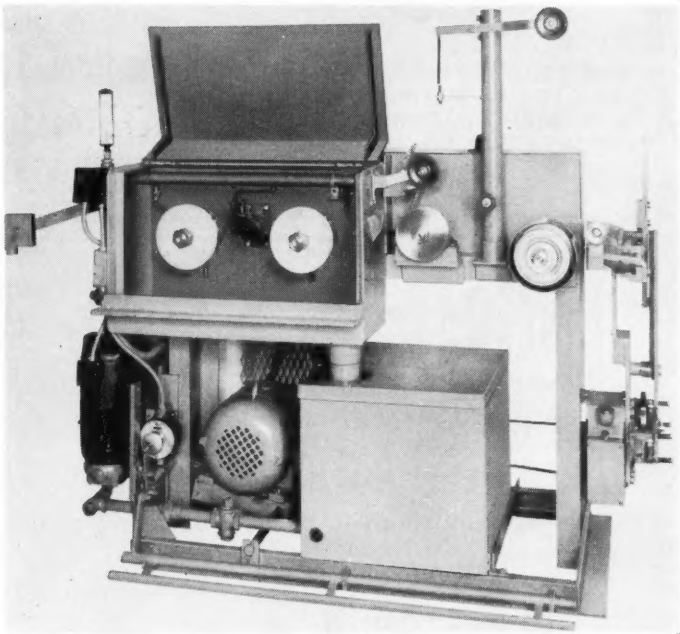
Industrial type tubes are provided with constant voltage transformers to maintain proper tube filament voltage values regardless of line voltage fluctuations.

★ ★ ★

Request Bulletin No. 1440 for complete additional details.

THE WIRE ASSOCIATION
invites wire men to join the organization and participate in its activities.
Write for a booklet on what it is and how it functions to
RICHARD E. BROWN
Executive Secretary
453 Main Street Stamford, Conn.

draw wire *FINE* with Cook's "A-9"
this all new, fine wire-drawing machine is fast!



LOOK TO COOK—*for pace-setting advances!*

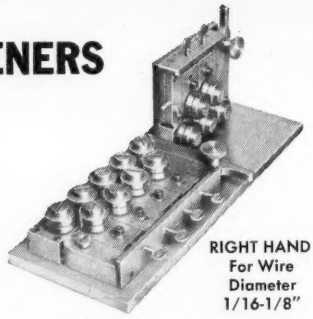
• NEW TYPE SPOOLER • DIRECT COUPLING • 9 DIES ON "A-9" • OCCUPIES LITTLE SPACE (2½' x 4') • SIMPLE TO OPERATE • FINISH SIZES: 34 B&S GAUGE TO 43 B&S GAUGE, @ 3000 F.P.M. • REEL CAPACITY: 5 LB. OR 10 LB. COPPER SPOOL • LOW COST

Prompt Delivery

Write or phone for construction and performance details

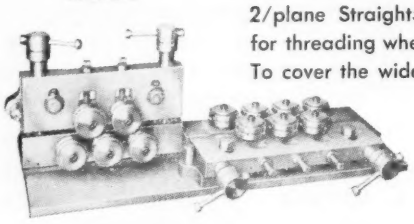
COOK MANUFACTURING COMPANY
50 E. 25th Street, Paterson, N. J. **Armory 4-6380 or 6381**

Sjogren 2 PLANE ROLL STRAIGHTENERS



RIGHT HAND
For Wire
Diameter
1/16-1/8"

LEFT HAND
For Wire Diameter
3/16-3/8"



Sjogren Two Plane Roll Straighteners are fully ball bearing for heavy production duty. They are designed to accommodate all sizes and grades of round or shaped wire whether it be high carbon, low carbon or copper, as well as the many alloys, from .010" to .375". Once set for the job at hand Sjogren 2/plane Straighteners may be opened and closed for threading when making coil changes without effecting the adjustment of the setting. To cover the wide range of wire diameters there are several size groups manufactured with either left or right hand direction. Each is individually produced to exact specifications for the grade, size and type of wire to be processed. Sjogren Two Plane Roll Straighteners do their duty each day, every day in the year.

Used by Wire Men Who Want the Best!

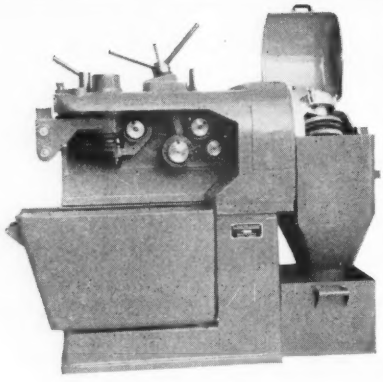
SINCE S&S 1927

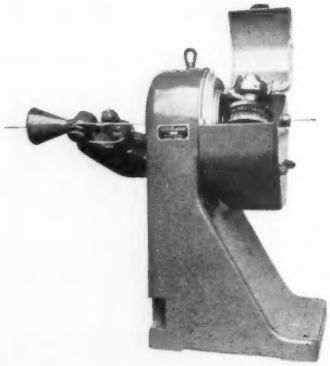
WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

SJOGREN TOOL AND MACHINE CO., INC.
Tools for The Wire Industries
14 SWORD STREET, AUBURN, MASSACHUSETTS

LINÉ-GORCY
MECHANICAL
WIRE ROD DESCALERS
(Patented in U.S.A.)

Users acclaim them—
RUGGED!
EFFICIENT!
LOW IN COST!





Demonstration Descaler available for convincing tests on 1/4" max. rods in your wire mill!

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THEIR ALLOYS
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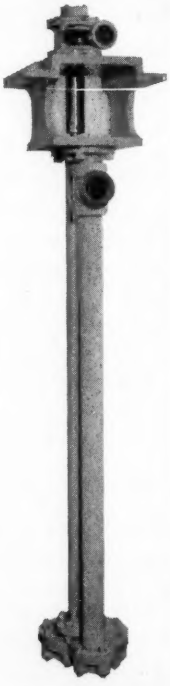

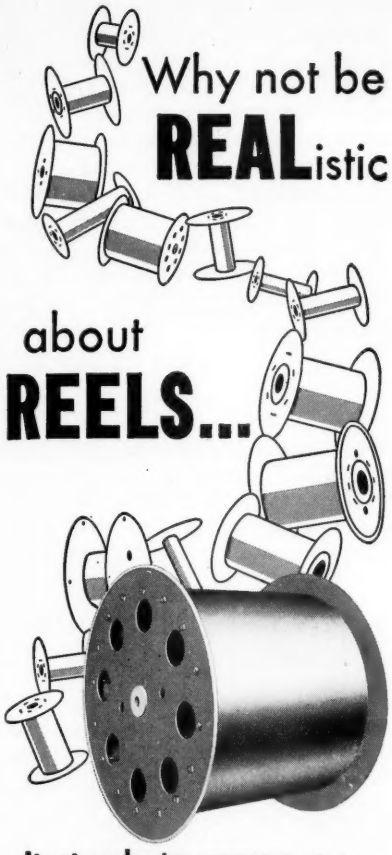

Why not be **REAL**istic about **REELS...**

It stands to reason that a company that's been doing a specialty job for more than 50 years really has the hang of it.

Apco Mossberg Company, for over a half century, has been everlastingly at the job of providing manufacturers of copper wire, steel wire and wire rope with all types and sizes of high quality steel reels, spools and bobbins.

Apco trained engineers consider each and every inquiry regarding steel spools, reels or bobbins separately . . . give individual attention to the design and construction to make certain that customers' requirements are carried out to the letter.

Reels are available in all sizes and shapes . . . for all applications. Write for further details today.

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47 Colborne Street, West
Toronto, Ontario, Canada

The original Frank Mossberg Company

APCO MOSSBERG COMPANY
ATTLEBORO, MASS.

New Bulletin on Lubricants and Coolants for Carbide Tools & Dies

The Metal Carbides Corporation, Youngstown, Ohio, announces the publication of a new Technical Bulletin No. TB-2 entitled "Recommended Coolants and Lubricants for Talide Tungsten Carbide Cutting Tools and Drawing Dies." Included in the above recommendations are coolants and cutting oils for machining all types of steels, ferrous and nonferrous metals, and non-metallic materials as well as lubricants for drawing all types of wire, bars and tubes. In addition, lubricants are included for use on a variety of other metalworking operations including cold swaging, cold extrusion, cold heading, impact extrusion, curling, cold nosing, spinning, bearing surfaces, rolling and other similar operations.

INCO Expands Distribution Facilities at Huntington Works

Engineering innovations for product protection, high-accuracy "print-weight" scales, and one of the largest truck terminals in metal warehousing, are some of the features of **The International Nickel Company's** new distribution center at Huntington, West Va.

★ ★ ★

Planned and engineered to speed operations, the recently completed $1,700,000 unit will greatly improve handling of materials from the point of shipment. The new center has the latest equipment for straightening, cutting and inspecting its metal products. Among these are Inco Nickel Alloys in the form of sheet, strip, rod, wire and tubing, which are "tailor-made" specialties of the Huntington Works. The plant produces more than 400 separate products in 19,000 different sizes. During the course of a year, all material going out of the plant will be weighed on "print-weight" type Toledo scales, ten times more accurate than is required by the U. S. Bureau of Standards.

★ ★ ★

The distribution center, which will increase warehouse facilities by 50 per cent, comprises three

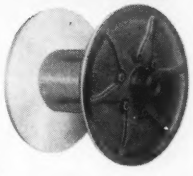
HAVING TROUBLE WITH LIGHT WEIGHT REELS FAILING IN HEAVY DUTY SERVICE?

MILTON MACHINE *offers you*

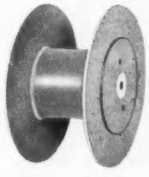
A SOLUTION TO YOUR PROBLEM that'll save on replacement and maintenance!

RUGGED STEEL
HEAVY DUTY PROCESSING REELS

HEAVY DUTY REEL
Designed for the heavy duty service of a wire rope manufacturer. Flanges with rope brake rim grooves are heavily ribbed semi-steel castings.



WELDED STEEL REEL
Made to wire rope mill's specification to replace light weight pressed steel reels that failed in heavy duty service.



SOLID STEEL PROCESSING SPOOLS & BOBBINS

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Your inquiries are invited . . . write or phone, our field engineer-representative will be glad to describe our facilities.

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DESIGNERS – ENGINEERS – MANUFACTURERS
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- DESIGNED FOR COMPLETE VERSATILITY
- BUILT FOR SAFE, EFFICIENT PRODUCTION
- SINGLE OR MULTI-DRAFT OPERATION
- INTERCHANGEABLE UNITS AND PARTS
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- WATER COOLED BLOCKS AND DIES

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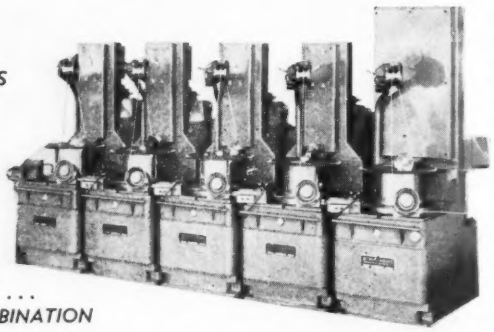

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finish · temper · gauge · length
SHIPPED TO YOUR SPECIFICATIONS...

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STRAIGHTENED AND CUT WIRE

Applicable to a wide variety of end uses, CALWICO Straightened and Cut Wire is your best buy. For complete information mail the coupon below.

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Please send data on CF&I Straightened and Cut Wire.

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CALWICO STRAIGHTENED & CUT WIRE
THE COLORADO FUEL AND IRON CORPORATION CF&I

60-foot bays in which there are three overhead cranes. In ground dimensions, the center covers an area of 400 by 180 feet with an adjoining covered storage yard, 400 by 80 feet, serviced by a fourth crane. In addition to tracks of the plant railroad, a Chesapeake and Ohio Railway spur track services the center. Seven truck docks, easily accessible by a new road, eliminate the necessity of trucks traversing the main plant grounds.

★ ★ ★

The Huntington Works' distribution center is another phase of a continuing expansion and modernization program—a program which has helped Inco meet the demand for its products needed for civilian uses as well as for defense.

Big Press for Cemeted Carbides Installed by Carboloy

For the first time, single, solid pieces of cemented carbide as heavy as 4000 pounds can be produced in a new 220-ton hot press installed recently in the Detroit plant of **Carboloy Department of General Electric Company.**

★ ★ ★

The press is capable of producing parts for such purposes as large die sections, rolls for rolling steel strip, large punches for cold extrusion work, large wear resistant linings for brick molds and many other uses.

★ ★ ★

One of the largest of its type in the cemented carbide field, the 19-foot hydraulic unit is capable of compressing huge pieces of carbide ranging in size approximately 21 inches in diameter by 21 inches high, or 7 inches in diameter by 5 feet high, the dimensions of the piece being determined by the weight. It places Carboloy Department in a position to expand its market in supplying large cemented carbide pieces previously impossible to produce.

★ ★ ★

Already in limited production, the huge press cuts hot press processing time by 50 per cent, over the previous method used for smaller pieces. It also is capable of

handling smaller pressings, such as conventional draw dies, capstan rings for wire, Hevimet counterweights and blanking dies at even less heating and pressing time.

★ ★ ★

The pressing technique is so new that the full capacity of the press it not at present being used. Carboloy Department engineers, however, are surveying the field for other possible applications, both to keep the new press at full production capacity, and to provide users of such large parts, the full benefits of the new pressing technique.

New Line of Wireways Announced

A completely new line of wireway and auxiliary gutter has been introduced by **National Electric Products Corporation**, Pittsburgh, Pa.

★ ★ ★

Called National 6 x 6 Wirewa, the new continuous raceway is said to provide unusual flexibility of distribution and permits relocation of plant electrically powered equipment at lower cost.

★ ★ ★

Designed to allow greater capacity to meet the ever-increasing demands being placed on an accessible raceway, 6x6 Wirewa is made in lengths of one, two, and five feet. Various fittings for "T", "L", and cross-over and junction boxes are being manufactured. The raceway is die-formed from .078 steel and finished in durable baked gray enamel. For use in corrosive locations, 6x6 Wirewa is made of galvanized steel and finished in baked gray enamel.

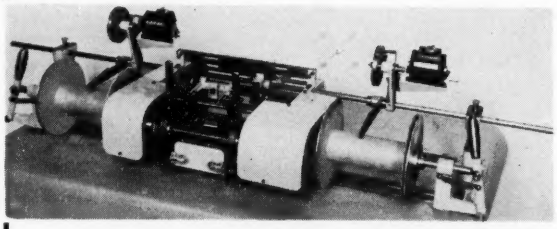
★ ★ ★

The new product embodies all features of the firm's standard 4x4 Wirewa—hinge cover; positive latching; and rigid, easy-to-install couplings. A special adapter, to allow use with the 4x4 Wirewa, has also been introduced.

New Bulletin on Vacuum Cleaning Systems

Bulletin A-939, released by the Air Appliance Division of **U. S. Hoffman Machinery Corporation,**

A NEW BENCH SPOOLER



Illustrated:
THE BOYD No. 6000 BENCH SPOOLER

- **RUGGED PRECISION ENGINEERED SIMPLICITY**
- **CONSISTENTLY ACCURATE WINDING**
- **SUPERIOR PACKAGE APPEARANCE**
- **"DESIGNED TO LAST" CONSTRUCTION**

Available with one or two spindles having common traverse and individual drive for each spindle. The spindles are started independently by manual control and halted automatically by predetermining counters and solenoid action. Traverse rates and travel are easily and quickly changed to suit your needs. Screw reversing mechanism controlling traverse can be adapted to wire, tape, plastic, etc. as required.

Further particulars may be had upon request.

BOYD & SONS MANUFACTURING CORPORATION

1434-38 Callowhill Street **Philadelphia 30, Pa.**

CARL-MAYER
Hi-SPEED REGISTERED
ROD BAKERS

PATENT Nos.
U.S.A.
2,235,559
2,296,361
2,323,828
CANADA
396,144
401,589

GREATER SPEED AND FUEL ECONOMY PROVES OUTSTANDING ENGINEERING

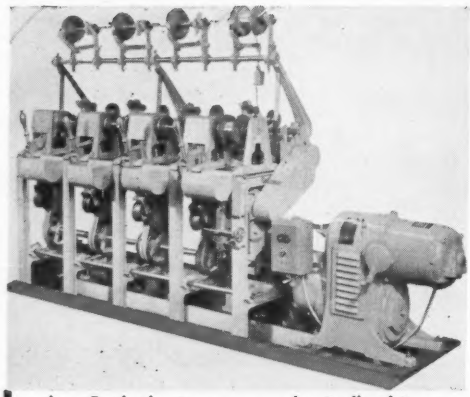
Carl-Mayer Hi-Speed Rod Bakers have an exclusive heating arrangement, combining faster baking with amazing fuel economy—and a patented Blow-Off feature which removes moisture without bumping or agitating the coils. *WRITE FOR BULLETIN NO. 350.*

ALSO OTHER TYPES OF INDUSTRIAL OVENS AND FURNACES

SERVING CONCERNS LIKE THESE:

American Steel & Wire Co.
Atlantic Wire Co.
Atlas Steel Co.
Atlas Tack Corp.
Babcock & Wilcox
Canadian Steel Corporation.
California Wire Cloth Corp.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America
Eaton Manufacturing Co.
Frost Steel & Wire Co., Ltd.
B. Greening Wire Co., Ltd.
Gary Screw & Bolt Division of Pittsburgh Screw & Bolt Corp.
Hollup Corp.
Indiana Steel & Wire Co.
Johnson & Nephew, Ltd.
Jones & Laughlin Steel Corp.
Page Steel & Wire Co.
Pittsburgh Tool Steel Wire Co.
Republic Steel Corp.
Steel Co. of Canada

THE CARL-MAYER CORPORATION
3030 EUCLID AVENUE
CLEVELAND, OHIO



1900-HV MULTIPLE SPINDLE SPOOLER

SPECIFICATIONS
Size Range: .010" to .080" or heavier if soft and many flat wire sizes.
Max. Spool Size: 16" flange diameter.
Capacity: usually 4 to 8 spindles.

The 1900-HV Spooler is a rigid, precision machine which will consistently produce a uniform, dense wire lay. Both the traverse and spindle drives are regulated through wide-range, stepless, variable speed units, eliminating change gears. The 1900-HV is completely adaptable to your particular constant or changing demands. All controls are positive. Adjustments are made accurately with the spooler in operation and without tools.

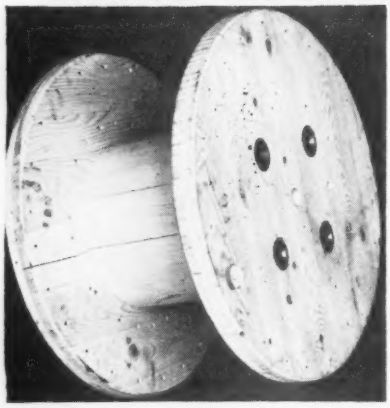
Both smooth acceleration and rapid stopping is obtained through a single lever at each station. Spool changing is simple and rapid. Anti-friction bearings are used on all shafting and spindles.

Your special requirements can be incorporated into the design. Each machine is delivered ready for operation from your power supply. Payoff stands furnished as extras.

Consult us on your spooling problems.

ROBERT J. EMORY COMPANY
31 East Runyon Street Newark 5, N. J.

LARGE BOLTED REELS for
WIRE ROPE
and
ELECTRIC CABLE



View of typical bolted reel.

Made in diameters of from 12" to 48" and furnished knocked-down or assembled. Sturdily constructed of air-dried lumber, using our Linderman process of jointing and well-nailed for strength and rigidity, these strong reels will take severest punishment. Our reels are made to customers' specifications as to size, number of bolts, size of washers, borings and number of plies in each flange. Painting or stenciling can be done as customers may request.

Shipped to any point in New England by truck.

Write for details and prices on these reels

WINCHESTER REEL COMPANY, Inc.
ASHUELOT, N. H. Tel.: WINCHESTER 163-2
Our Products Carry Reel Loads.

105 Fourth Avenue, New York, N. Y., analyzes the costly problem of industrial dust and describes a complete line of vacuum cleaning equipment designed to combat it.

★ ★ ★

The basic working elements of the company's permanently installed vacuum cleaning systems with central dust collection are described in detail. The booklet also explains and illustrates a full range of coordinated vacuum cleaning accessories.

★ ★ ★

Portable vacuum cleaning units ranging from 1½ to 7½ horsepower are pictured. Mention is made of the adaptability of vacuum cleaning systems to the collection and conveying of dry materials.

★ ★ ★

A special list of five questions covers preliminary data required for the design of any plant vacuum cleaning system, which can be filled out for advice on individual dust problems.

New Slipper Compound for Type TW Wire

A major problem that has plagued electrical contractors appears to be well on its way toward solution—the problem of pulling type TW no matter what the weather or what conditions are encountered in residential, commercial and industrial buildings. Tests in the laboratory, and extensive production-testing in the field, have demonstrated that Anaconda's new type TW with its special "slipper compound" appears to meet the important objections contractors' men have made in the past against most other lines on the market.

★ ★ ★

The new slipper compound does not deteriorate with aging, nor do its oils dry out in use.

★ ★ ★

Anaconda's type TW is highly resistant to moisture, oils and most chemicals. It has excellent flame resistance and won't burn.

★ ★ ★

Other characteristics in the new

type TW are its exceptional long life; higher tensile strength of the conductors; minimum porosity in insulation; and uniform size and smoother surface finish with more eye-appeal.

★ ★ ★

The new type TW is available in sizes from No. 14 Awg to 2,000 Mcm.

Mystery Story Language Makes Sense to Steelmen

Crook, spy, arrests, charges, trial bar and hanging are familiar terms to mystery story fans. They also have meanings of an entirely different nature in the steel industry, although some of them are equally disagreeable.

★ ★ ★

For example, a "crook" in steel terminology is a distortion sometimes produced in cooling a casting. A "spy," however, is a prosaic sample bar selected at random for inspection. "Arrests" are interruptions in certain steel processes and operations. A "charge" is the name given to materials when they are put into a steel plant furnace; a "trial bar" is another word for the "spy" described above. "Hanging" is what happens when raw materials stick to the sides of a blast furnace, forming obstructions.

—from STEEL FACTS, Feb. 1954

Carbide Tools Demonstrate Economy Through Long Life

Discarding steel cutting tools at the rate of more than one tool per acceptable part gets to be an expensive proposition.

★ ★ ★

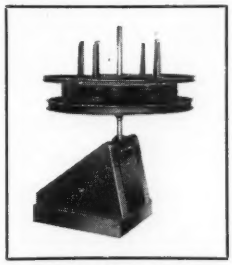
At Master Machinery Builders, Detroit, where this situation existed, a second problem also faced the company—that of producing fine finishes on a highly abrasive aluminum-bronze die casting.

★ ★ ★

The big questions were: How to produce this complex part for the control assembly of a medium tank without ruining tools to the point of no return and to produce a fine finish? Even tapping 12 holes with a No. 5-40 steel tap, for example,

MOSLO "SHIFTWEIGHT"
COUNTER-BALANCED WIRE REELS

Take the Manual Labor out of loading a Reel with Wire. Just unlock the knurled spindle by a twist of the wrist, tilt the reel assembly 90°, roll coil of wire to reel, lift 6" on to centering arms, release lock by twist of wrist, use spindle as lever to lift, and the *Weighted Counterbalance does the rest!*



Immediate Delivery
$190.00 F.O.B. Cleveland

Capacity 300 lbs.—Min. Coil I.D. 10"—Max. O.D.—41".
All welded steel construction—Brake Equipped.

MOSLO MACHINERY COMPANY
2443 PROSPECT AVE. • CLEVELAND 15, OHIO
Telephone MAIN 1-8864

VINYLS for...
CRITICAL CUSTOMERS

For the past ten years we have specialized in the compounding of Vinyl extrusion and injection molding compounds to specifications, or developing compounds for a specific use.

Underwriters' approved standard compounds are available in all colors for POT, T, TW, 80 Degree C, 90 Degree C and 105 Degree C wires.

Save your plant space for wire processing equipment. Let us tailor your compounds to bring out the special properties you require.

Your inquiries are invited.

ELECTRONIC RUBBER COMPANY
69 Sunnyside Ave. • Stamford, Conn.

FOR TESTING ENAMELED WIRE

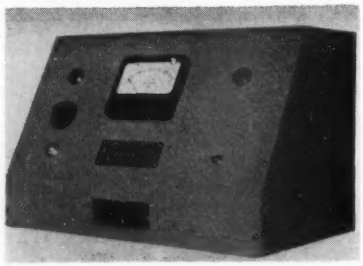
DIELECTRIC TESTERS

½ KVA Stepless Range of 0 to 15,000 volts.

•

OTHER FEDERAL EQUIPMENT

• Abrasion Testers • Capstans
• Measuring Machines • Electrodes
• Cord Set Testers • Take-Ups



CONTINUITY TESTER
With Mercury Electrode
20 to 300 volts, D.C.

•

Optional Equipment

Variable Resistance Package Unit—Including Pay-off and Take-up.

Export Agents:
Ballthrall Trading Co., Philadelphia

Federal Manufacturing Co.

SPECIAL WIRE MACHINERY

236-240 Hall Avenue, Wallingford, Conn.

speed up your production with

SHEFFIELD
manufacturers wire

Sheffield Manufacturers Wire is drawn from steel made from furnace to finished product in Sheffield's own mills. Quality is checked and guarded at every step. Perfect uniformity and accuracy of gauge are assured, for greatest efficiency in your operation.

Sheffield is prepared to serve your needs quickly for manufacturers wire in any quantity. Get in touch with your nearest Sheffield office.

KANSAS CITY, MO. • TULSA, OKLA.

SHEFFIELD STEEL CORPORATION

HOUSTON, TEX.

wore the tap beyond possibility of economical repair.

★ ★ ★

Both problems were licked with dramatic results when cemented carbides were brought into the picture. With carbides, tool life jumped 2400 times. Over 200 parts were produced per tool grind. And to date, nearly 3000 parts have been completed without a single reject. The cemented carbide involved is Carboloy grade 78B, brazed to standard tools made by **Carboloy Department of General Electric Company.**

New Radiography Booklet Available from Du Pont

A guide for x-raying such metals as steel, magnesium, and aluminum, with recommendations as to type of film and exposure for each, is described in a new 28-page, three-color booklet now available from the Du Pont Company.

★ ★ ★

The booklet, titled "Du Pont Products for Industrial Radiography," provides exposure and processing data for each of the company's films used in industrial radiography. The booklet is attractively printed in contrasting yellow, brown, and black and may be obtained from the **Du Pont Photo Products Department,** Wilmington 98, Delaware.

New Service Plan for Wire Rope Users

Broderick & Bascom Wire Rope Co., St. Louis, Missouri, manufacturer of Yellow Strand Wire Rope, has devised a new service plan for wire rope users. Appropriately named the Yellow Strand Speedi-Service Plan, the unique program will be administered by more than 400 Broderick & Bascom distributors.

★ ★ ★

The core of the Speedi-Service Plan is a record file of equipment users' wire rope needs. These needs are determined by a survey taken by distributor salesmen or by facts supplied by the user himself. The facts obtained are transferred from the survey form onto permanant record cards, one for each piece of

equipment. At the time of transfer, distributor stocks are checked and any ropes that may be needed in the future are ordered for stock. The equipment records are kept up to date by distributor personnel.

★ ★ ★

When a rope requires replacement, the user just phones his Broderick & Bascom distributor, telling him what machine needs the rope and what rope it is. The distributor's rope men consult the handy record file and can tell in an instant the exact length, size, construction, grade, and lay of rope needed The wire rope order is filled from stocks maintained for the user's needs and is ready for delivery in minutes.

★ ★ ★

This service is now offered by all Broderick & Bascom distributors. Survey forms can be obtained from them or by writing the Broderick & Bascom Rope Co., St. Louis 15, Mo.

Announces New Synthetic Resin Bonding Cement

The Ceilcote Company, 4846 Ridge Road, Cleveland, Ohio, has announced the availability of Corobond, a new improved synthetic resinous bonding cement for brick and tile. The new material resists the corrosive effects of acids, alkalis and solvents. Chief advantage of the new cement is its superior workability and longer pot life, which provides a greater working time prior to initial set, regardless of temperature.

★ ★ ★

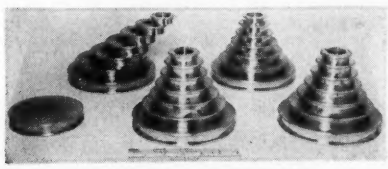
A mixture of acid hardeners, acting on a delayed reaction principle, slows the initial hardening of Corobond and allows ample working time when large batches are mixed. Once started, final cure proceeds rapidly to permit continuous laying-up without extrusion from the bottom courses and to prepare the structure for use within a relatively short time. Corobond hardens with minimum shrinkage to an extremely dense material which provides high mechanical and tensile strength.

★ ★ ★

HIGH QUALITY
COPPER and BRONZE WIRE
All Sizes of Fine Wire
BARE and TINNED

SPENCER WIRE CORPORATION
555 LEHIGH AVENUE • UNION, N. J.
Plants at UNION, N. J. • Telephone: UNionville 2-7950

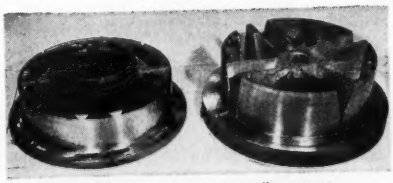
PK HARDSURFACING PAYS!



SYNCRO A-16 DRAW RINGS

Pictured at left and below are some wire drawing machine blocks. Many other parts can be hardsurfaced to advantage.

VAUGHN 20" BLOCKS



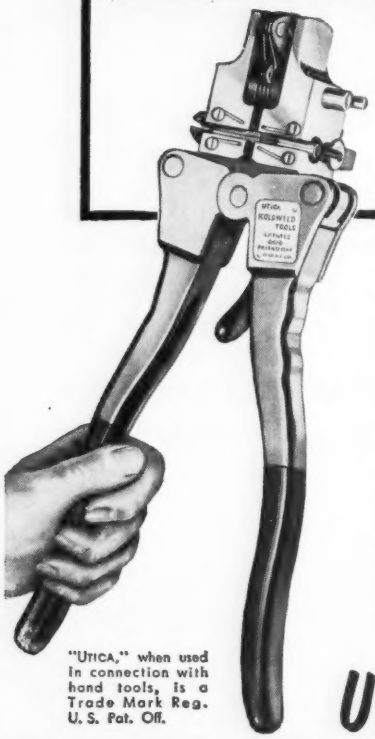
MORGAN-CONNOR 22" BLOCK

Parts last 3 to 10 times as long as standard equipment—Saves downtime — Cuts wire rejections — Increases production.

OTHER APPLICATIONS

Rollers and Idlers
Sheaves and Pulleys
Steel Crane Wheels
Hot Shear Blades

PARKWAY-KEW CORP.
P.O. Box 504 Tel.: Metuchen 6-4747 Menlo Park, N. J.



Carry a welding shop in one hand... *when you* KOLDWELD!

Many difficult wire welding jobs become easy ...with the new UTICA Koldwelder! It buttwelds through pressure alone. No heat, no electricity, no chemicals are needed. Flash snaps off easily, leaving wire diameter unchanged. Each weld takes only a few seconds—yet tests show UTICA Koldwelds have from 95% to over 100% the tensile strength of the parent wire.

You can weld aluminum, copper and other nonferrous metals right inside your machines or atop poles in the field! Weld similar or dissimilar metals...the same or different gauges. You get a solid intermolecular connection so homogeneous that after wire drawing the Koldweld is often impossible to locate. That's why UTICA Koldwelds are electrically perfect, never weather or corrode. Get all the facts on this new type of welding. Write now for full information.

"UTICA," when used in connection with hand tools, is a Trade Mark Reg. U. S. Pat. Off.

UTICA KOLDWELD

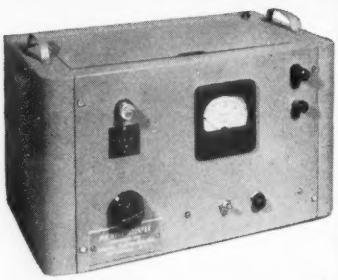
UTICA DROP FORGE & TOOL CORP., Utica 4, N. Y.

Jobs available for technically trained personnel

CONTINUOUS INSULATION TESTER FOR

MAGNET and OTHER FINE COATED WIRES

COUNTS AND RECORDS PIN HOLES AUTOMATICALLY AND ACCURATELY AT SPEEDS UP TO 600 FEET PER MINUTE.



FEATURES: 10 micro-amp fault detector • No damage to finest wire • No shocks • Moist felt electrode • No mercury • Check any length wire, up to 5 megohms • Detector operates counter, flashing lamp and rings bell • Accurate count—No repeats • Adjustable power supply and panel Voltmeter for single or multiple coated wire • Use in production lines following ovens or for inspection respooling.

Hitemp Wires, Inc., Mineola, L. I., uses the Peschel Pin Hole Tester to certify high quality and to speed up inspection.

Other production and inspection testers available

Write for details

PESCHEL ELECTRONICS, INC.

13 Garden Street **Tel: NE 6-3342** **New Rochelle, N. Y.**

The new cement, which is designed to eliminate the disagreeable factors ordinarily inherent in resin cements, also assures complete adherence to the building material. Corobond can be spread easily and pressed evenly into a tight joint without excessive pressure. Bricks do not slip or slide and extruded cement is neatly sliced off, leaving surfaces clean.

★ ★ ★

The ability of Corobond to withstand acids, alkalis, solvents, hot water and live steam makes it ideal for the construction of acid pickling and neutralizing tanks, plating room floors, sewers, linings for chemical process tanks and other installations requiring acid or alkali resistance or both.

New Bulletin Covers Straightening And Cutting Machines

Mettler Machine Tool, Inc., New Haven 11, Conn., announce a new folder Bulletin No. 58, on their line of Shuster Constant Speed Automatic Wire Straightening and Cutting Machines, ranging in capacity from .025″ to ½″ diameter wire. Please write the company for your copy.

Philips Host to Non-Destructive Testing Society

The New York Non-Destructive Testing Society held its regular monthly meeting on Monday, February 1 at the offices of the Research & Control Instruments Division, North American Philips Company, Inc., 750 South Fulton Avenue, Mount Vernon, N. Y.

★ ★ ★

The session opened at 7 P.M. with two talks given by Philips personnel. **Fred Behr** discussed "Non-Destructive Analysis using X-ray Spectroscopy and the X-ray Diffractometer" and **Ed Champaygne** explained and demonstrated the Philips electron microscopes.

★ ★ ★

The part of the program dealing with the new EM-75 electron microscope was of special interest because it was the first demonstration of the instrument before this group of scientists.

START SAVING
in your
Die Finishing Rooms

•

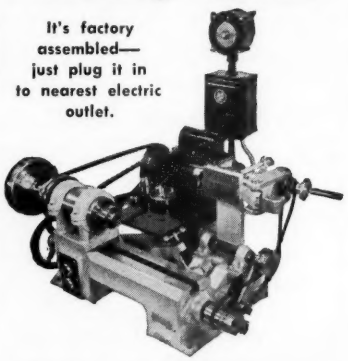
Double your Refinished Tungsten Carbide Die Production

CUT labor costs ½ with the New type "M" automatic

DYKREX
"IT CORRECTS THE DIE"

Polishing Machine

It's factory assembled—just plug it in to nearest electric outlet.



ROOS TOOL & MFG. DIVISION
Dykrex Corporation of America
manufacturers of
Wire Die Finishing Machinery
33 Bloomfield Avenue
Newark 4, N. J.
Western Union
Teletype Service
QAB-WUX—Montclair, N. J.
The Standard of the Wire Industry

Announces New Wire Strand Annealing Oven

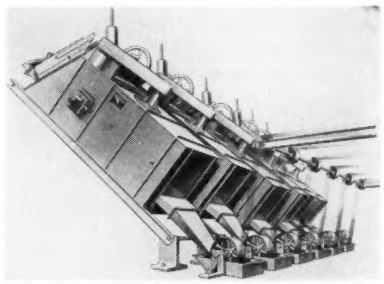
The Michigan Oven Company, designers and builders of industrial ovens, announces the introduction of a new gas-fired wire strand annealing oven.

★ ★ ★

The oven, which combines several unique design and construction features, is performing in several dozen applications.

★ ★ ★

The company claims that the product gives high annealing uniformity because of the very low



New Gas Fired Wire Strand Annealing Oven.

temperature variance, over a wide range of operating speeds.

★ ★ ★

A high volume of recirculation produces an increased heat transfer efficiency in this oven.

★ ★ ★

The unit, through its rugged welded construction, insures years of trouble-free performance.

★ ★ ★

The company will soon announce a complete new line of ovens for wire enameling. The Michigan Oven Company has technical representatives in principal cities.

★ ★ ★

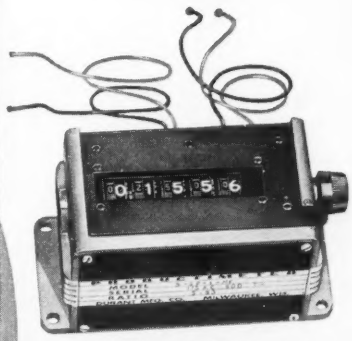
For further information, contact the Michigan Oven Company, 415 Brainard, Detroit 1, Michigan.

New Stainless Steel Selector Provides Quick Answers

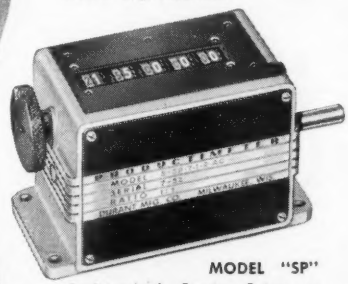
Metal-working shops have been receiving a new slide rule-like chart which quickly answers questions on the type of stainless steel

Predetermined *Runs* are PROFITABLE *Runs*

MODEL L-R-16-Q
Wire Measuring Machine with Predetermined Counter Speed 2000 F.P.M.



ELECTRIC "SP"
Predetermined Counter Counts Electrically — Lights LIGHT, Rings BELL, Starts or Stops MACHINE.



MODEL "SP"
Predetermined Counter Rotary or Stroke Models Lights LIGHT, Rings BELL, Starts or Stops MACHINE, mechanically.

DURANT MFG. CO.
1918 N. Buffum St. 118 S. Water St.
Milwaukee 1, Wis. Providence 3, R.I.
Representatives in Principal Cities

Send for Catalogs

PRODUCTIMETERS *Count Everything* 75th ANNIVERSARY

BUNCHING
(TWISTING)
AND
STRANDING
IN THE WIRE AND
GENERAL MANUFACTURING
PROCESSES

SPECIALIZED
ENGINEERING
AND
SPECIALIZED
FACILITIES
AT YOUR SERVICE

Expanding application of twisting principles to the production of many products is reflected by an ever-increasing demand for both H-D standard equipment as well as machines especially engineered to solve varied production problems. Week after week surprising new uses are developed through the close cooperation of our engineering department with manufacturers in many fields.

Write today for our New Technical Bulletins. Tell us what you make—or contemplate making and your inquiry will receive prompt attention.

HASKELL-DAWES
MACHINE CO., INC.
2231 E. ONTARIO ST.
PHILADELPHIA 34
PA.

to be used for about 95% of operations requiring use of stainless.

★ ★ ★

The stainless steel selection method covered by the chart, designed especially for the use of fabricators, designers, purchasing agents and others who do not have metallurgical training, was developed by **Hugo Becker,** assistant product manager of **Crucible Steel Company of America's** tool steel products. Mr. Becker designed a similar chart for the selection of tool steels in April of 1950.

★ ★ ★

Mr. Becker's chart grew out of Crucible's findings that most stainless metal-working failures and losses result from wrong selection of stainless steels. Such failures can be a great hardship to smaller business and metal-working organizations, according to **J. D. Glenn,** the company's Stainless Steel division sales manager.

Carboloy Adds Sales Engineer in Detroit

Francis R. Flood, formerly in the product planning section at **Carboloy Department** of General Electric Company, Detroit, has been named a sales engineer, specializing in chrome carbides.

★ ★ ★

Mr. Flood received a B.S. in industrial engineering in 1951 from Lawrence Institute of Technology, Highland Park, Mich., and was a diesel service instructor at Detroit Diesel Engine Division of General Motors Corp. before joining Carboloy in 1951.

Diversification

A prime example of product diversification can be found in the product-line of the **Brown Instruments Division** of Minneapolis-Honeywell. Ninety-four years ago it produced a simple temperature-measuring instrument known as a pyrometer. Today, 20 classes or groups of products made by the division form the basis for more than 15,000 different applications. These, in turn, stretch throughout the 450 industries of the world.

7 out of 9
WIRE MILLS
that Liquor Finish Wire
use
STANNOUS
SULFATE
because

Tin Losses Are Reduced . . .
by elimination of high tin sludging due to incomplete reaction in feather tin method.

Results Easier to Control . . .
only two variables to watch — Stannous Sulphate and Copper Sulphate — allows immediate, simple color adjustment.

Every Batch the Same . . .
M&T Stannous Sulphate method produces smooth, uniform wire coatings, unvarying from lot to lot.

See how use of M&T Stannous Sulphate can help you save tin in liquor finishing. Write for engineering data.

METAL & THERMIT CORPORATION
Chemical Division
100 E. 42nd St., New York 17, N. Y.
Specialists in Tin and Tin Chemicals

A Book Every Wire Man Should Own And Read...

"STEEL WIRE IN AMERICA"

written by Kenneth B. Lewis, as only he could write. This remarkable book treats of the various operations in wire making, giving the history and theories underlying each process, tracing the development of machinery, equipment and supplies used in the industry, and naming those individuals and companies involved in the evolution of our industry to its present stage of development. A highly readable treatise. You'll like it!

The book, sponsored by the Wire Association, is an unusual contribution to the literature on the art of making wire. It is not a handbook nor reference work, but is one that will bear much reading, re-reading and study. Any wire man will be better equipped for his work through a knowledge of the contents of Mr. Lewis' book.

The edition is limited and orders can be filled only as long as the small supply lasts.

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Send your order today to assure yourself of a copy.

BOOK DEPT.

THE WIRE ASSOCIATION

453 Main Street

Stamford Conn.

Arc-Welding Electrodes and Their Manufacture

(*Continued from page* 412)

silicate); 2 the position (here upright and horizontal-vertical); 7 is the kind of current (here Gl+ and alternating current 45V). In the United States a similar standardization to ours is in use. And now the International Welding Institute is preparing a system of standards available for all countries. Outside of the standards, authorities such as the Federal Railways and Classification Associations like British and German Lloyd, Veritas, etc. have their own license specifications.

★ ★ ★

There are important advantages in fusing two or several electrodes simultaneously in the same holder. There are two cases to be distinguished here: a double electrode is clamped in a special holder which by secondary winding is connected to two leads of a three-phase transformer, whose third lead lies against the work-piece; or a bundle of two or several electrodes which can be up to double the length of the usual electrode is clamped in a special holder which is connected to a conductor. In both cases, however, welding can be accomplished only in the upright and horizontal-vertical position, not in constrained positions. For welding with rare gases, in Germany the argon arc process has been successful.

★ ★ ★

For this an uncoated wolfram electrode has mostly been employed; this fuses off with difficulty; the alloyed wire is placed in the gas surrounded arc in the slot. This process is especially adaptable for the welding of light metal and stainless steel without waste of welding flux. The atomic hydrogen arc welding process with two wolfram rods and hydrogen supplied to the holder is as yet used only for the repair of tools. In this process a special filler rod is introduced, with the other hand, through the arc (blown to a point) and fused upon the work-piece.

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Borax and Borax 5 Mol Offer Many Advantages as a Coating Material

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Check these advantages of borax-coated stock:

- COMPATIBLE WITH DRAWING LUBRICANT
- BETTER WORKING CONDITIONS
- FASTER BUTT WELDING
- LONGER DIE LIFE
- LONGER STORAGE SAFETY
- CLEANER TO HANDLE IN TRANSIT

Write for Technical Data Sheet #2 WD

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DIVISION OF BORAX CONSOLIDATED, LIMITED

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MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

MIL-W-5086 WAS QUITE A PROBLEM

In fact it was three times a problem. We had to satisfy the Military Specification (which is MIL-W-5086). Then we had to satisfy the manufacturer of the wire. And finally there was the ultimate user of the wire who knew what he wanted —and demanded just that.

The story went like this:

MIL-W-5086 is a Military Specification covering aircraft electrical wire. To satisfy it our job was to develop a NELCO cable coating which would have abrasion resistance, fungus resistance, flexibility at temperatures as low as —55 degrees C. and, finally, be resistant to many liquids used in and around aircraft.

Specifically, the aircraft builder required the NELCO cable coating to withstand the hydraulic fluid that occasionally gets loose in a plane and causes serious damage to wire lacking a proper protective coating.

And, of course, the wire manufacturer had to have a cable coating which could be easily applied.

We turned this many sided problem over to our competent laboratory staff.

We don't say it was the same day they came up with the perfect cable coating but they did have it in a comparatively short time.

The above problem is typical of what our laboratory must face in preparing NELCO cable coatings for every conceivable condition.

Watch this column for more information on cable coating problems we have met and solved.

. . . and if you've found something of interest here, we'd like to hear from you.

NEW ENGLAND LACQUER CO.

150 King Philip Rd., East Providence, R. I.

Announces New Predetermined Electric Productimeter

The Durant Manufacturing Company has announced the first electrically operated Predetermined Counter to be offered on the market. Production can be controlled on any electric counting installation to the exact quantities required, thus eliminating losses due to over-runs or under-runs.

★ ★ ★

This new "SP-MF" Predetermined Electric is constructed like the small "SP" Predetermined models brought out by Durant in 1953. They are entirely enclosed for protection against dust and moisture, designed in a modern straight-line motif in attractive tones of silver gray and seal brown. Over-all dimensions are 4⅜" wide by 2⅛" deep and 2⅝" high. Weight is 1¾ pounds. Speed is 600 counts per minute.

★ ★ ★

Available in either four or five figures, these "SP-MF" models are actuated by electric impulses to close or open a switch at any preset count from 1 to 9999 or 1 to 99999 respectively. A metal hinged cover provides quick access to the predetermined wheels for easy setting.

★ ★ ★

This Predetermined Electric Productimeter, brought out in Durant's 75th Anniversary Year, answers the demand for a compact, accurate, rugged, electrically actuated counter that will fit the dimensional requirements of various installations, such as: electronic computers and nuclear instruments; light production machinery; packaging, tabulating or addressing equipment; coil winders; machine tools; and conveyor lines.

★ ★ ★

Bulletin No. 502 illustrating and describing "SP-MF" models is available upon request to the Durant Manufacturing Company, 1918 North Buffum Street, Milwaukee 1, Wisconsin.

New Machine for Stapling Cartons

International Staple & Machine Co., 801 Herrin Street, Herrin,

TRIPLE THREAT AGAINST CORROSION . . .

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TRADE MARK REG. U. S. PAT. OFF.

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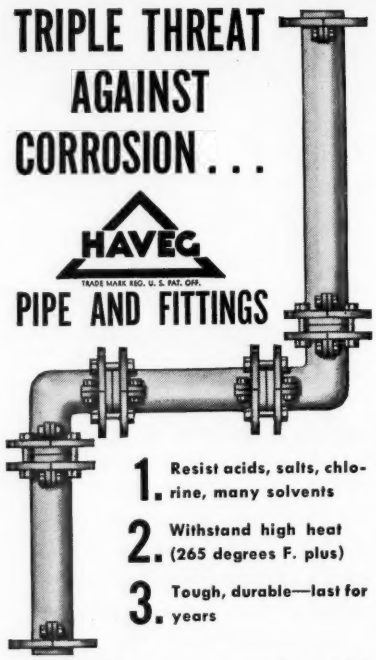

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Haveg is a moldable, thermosetting plastic made by mixing acid-digested asbestos with special resins. Haveg process equipment is unusually resistant to most acids, salts, chlorine, many solvents . . . and withstands extremely high thermal shock. Haveg is really a triple threat against corrosion!

Send for 64-page Bulletin F-6. It contains complete information on Haveg pipe, fittings, valves, pumps, cylindrical and rectangular tanks, heat exchangers, and other corrosion-resistant process equipment. Call your Haveg sales engineer for first-hand facts.

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* A Subsidiary of Continental-Diamond Fibre Company.

SEND FOR 64-PAGE HAVEG BULLETIN F-6.

Illinois announces the release of a new eight-page, two-color booklet, #Q-501, on International Staple Queen packaging machines, a large semi-automatic model. The staplers illustrated and described in the brochure close center-slotted cartons top and bottom simultaneously, or will close tops only or bottoms only, as needed.

★ ★ ★

The company has listed specifications on carton size capacity, available adjustments, number of closures per hour, and safety devices. A page is devoted to the exclusive Retractable Anvil staples and their operation.

★ ★ ★

Other points discussed in the booklet include floor space requirements, loading, carton re-use, operation of the machines and their conveyor units. Sizes of cartons the models will handle, plus carton specifications, facts about wiring, air pressure, air consumption and prices are detailed.

★ ★ ★

Copies of the new booklet are available on request.

Coming Events of

THE WIRE ASSOCIATION

REGIONAL MEETING, Hotel Sheraton, Worcester, Mass., April 22-23, 1954. Ferrous and non-ferrous technical sessions and plant visits. Two full days of interest and value to wire men.

REGIONAL MEETING. Los Angeles Statler Hotel, Los Angeles, Cal., in June. One day session. Full details will be published shortly.

ANNUAL CONVENTION, Statler Hotel, Detroit, Mich., November 8-11, 1954. Ferrous and non-ferrous technical sessions and two plant inspection trips. There will be many other features, including the Annual Luncheon, the Mordica Memorial Lecture, which will be commemorative to the Silver Anniversary of the Association, and the Annual Stag-Smoker Dinner and Show.

THE WIRE ASSOCIATION

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New Haven, Connecticut

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Norton Company of Worcester, Mass., announces that diamond grinding wheels are now available on normal delivery schedules.

★ ★ ★

Many of the standard sizes are available for immediate delivery from the plant, Norton warehouses and dealers' stocks. Manufacturing time for other wheels is from three to four weeks.

★ ★ ★

During the recent diamond shortage, Norton instituted a swarf reclaiming department to which customers could send grinding swarf and be credited with the diamonds which were salvaged. Wheel stubs were also salvaged. Because of the savings in grinding costs which customers have been able to realize in this manner, Norton plans to continue the salvage of diamonds from swarf and stubs.

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High Speed Wire Cutters and Benders. Wire Spot Welders and Wire Butt Welders. Ask for test samples. Established 1920.

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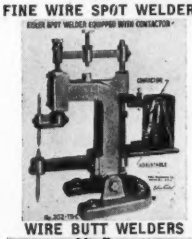

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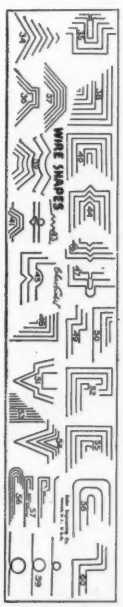
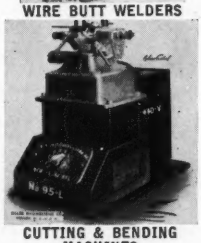


WIRE BUTT WELDERS



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DURKEE MFG. CO. **PINE RIVER, MINN.**

The Economy of Shaped Wire

(*Continued from page* 392)

ing. To produce this continuous slot opening, the shaped wrapping wire is welded in a circumferential spiral around the shaped wire rod members. The unique shape of both the wrapping wire and the vertical rods, shown in Figure 10, allows sand and gravel to make

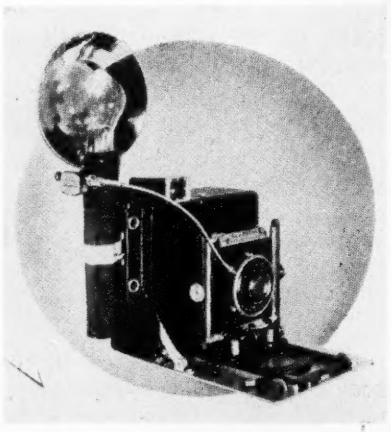

Figure 7—Some ten different parts of this new photo camera and flash gun assembly are stainless steel flat wire and precision rolled special shapes. * * * * * * * * * * * * * *

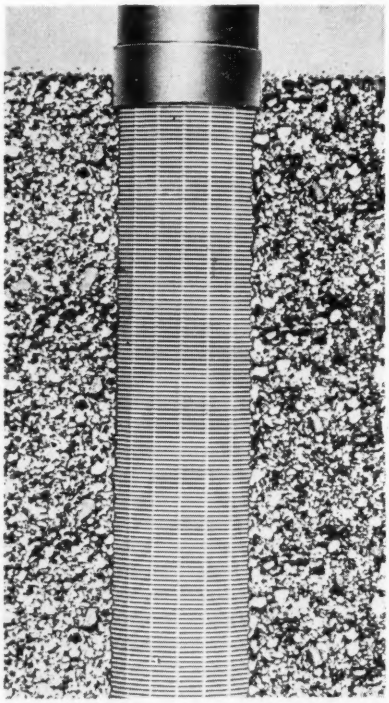

Figure 8—Johnson Well Screen used for the development of natural gravel-packed well. * * *

Figure 9—Construction of shaped wire and rod members of well point screen wire. * * * *

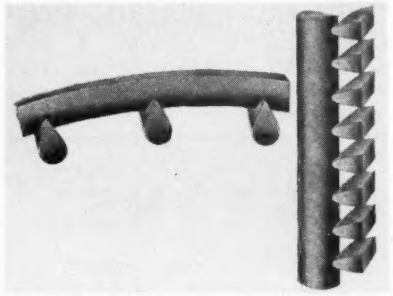

Figure 10—Close-up view of well point screen showing shape of the wrapping wire connected to vertical rod of slightly different shape. * *

contact at only two points on the well screen, thus making it impossible for grains to become lodged and close the slot opening. By utilizing shaped wire and rod members this well point screen eliminates the clogging and jamming which impede the efficiency of conventional well point screens.

★ ★ ★

Of special interest is the welding operation used in the manufacture of this screen. A special adaptation of the electric seam welder is used to weld the wrapping wire to the rotating rod assembly. As the wrapping wire touches each rod a surge of current welds the wire to the rod. Action takes place with water run-

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Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .3125"
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ning over the newly formed joint for cooling and heat treatment of the weld. Welding and winding of the outside wrapping wire are accomplished simultaneously, thus speeding the fabrication of the finished well screen. This unique method of resistance welding has proved effective with stainless steel, as well as other metals and alloys. In Figure 11, the current and the water have been momentarily stopped to show the welding process.

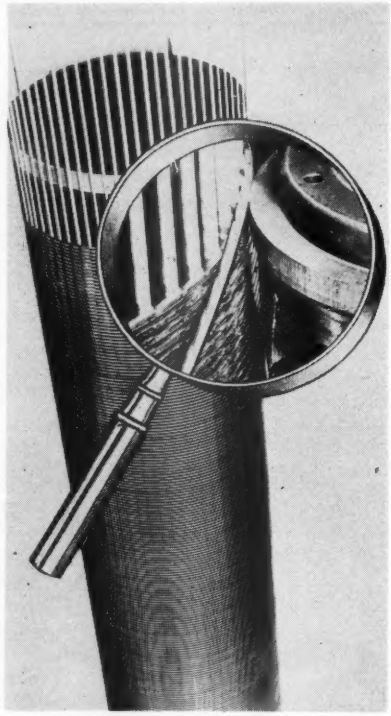

Figure 11—Welding process used in the fabrication of the Johnson Well Screen. * * * * *

Other current applications of shaped wire can be cited throughout the metal products industry and new uses are being found each day for this cost-saving material. These few examples, however, serve to indicate the vast possibilities which exist for the alert manufacturer who recognizes the design advantages and production economies possible with shaped wire.

THE WIRE ASSOCIATION
invites wire men to join the organization and participate in its activities.
Write for a booklet on what it is and how it functions to
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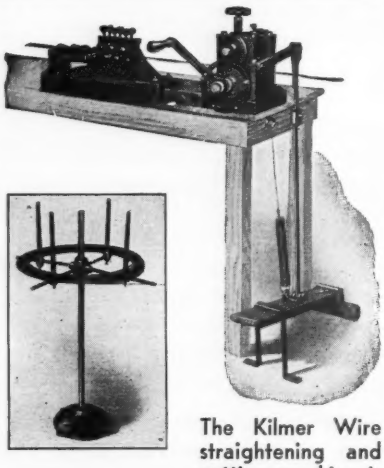

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Wire & Cable Symposium

(*Continued from page 407*)

in the conductor surface that is usually present. Such systems are not affected by rain and only slightly affected by dry snow or ice.

★ ★ ★

"Plastic Aerial Cable Construction" by D. J. Neale, Sr., Pres., Neale Construction Co., Inc., Topeka, Kansas.

The author considers in this paper, of the various forms of plastic sheath communication cable made, only polyethylene and polyvinyl sheath cables. He describes the types of supports such cable requires, pointing out that they are lighter than lead and can be used in longer span lengths, but various factors must be considered in determining how to install and support the cable so that it will not be damaged by installation initially or the elements ultimately. Various types of equipment and accessories useful in installation work, which includes splicing, are covered, all to the end that others who are concerned with the problems of installing plastic sheathed aerial cable may profit by the author's experience.

★ ★ ★

"Factors in the Selection of Carrier Systems" by H. R. Huntley, American Telephone and Telegraph Company, New York City.

In this paper the author states that the carrier system is now a primary method of supplying telephone circuits, where distances involved are over 25 miles long. The trend has been toward this system due to economy, although up to 1945 it was the exception rather than the rule.

★ ★ ★

As no one system is best for all conditions, the several types are discussed with indications of their applications given. Although the adoption of carrier systems has been rapid, it is due, the author states, to greater flexibility and lower cost terminals.

★ ★ ★

"Laytex Insulation for Communication and Control Cables" by C. J. Tappero, Laytex Eng., U. S. Rubber Co., Bristol, R. I.

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Handle heavy reels easily and safely; remove wire or cable from top or bottom, front or back of reel with

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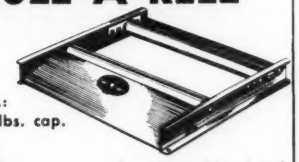

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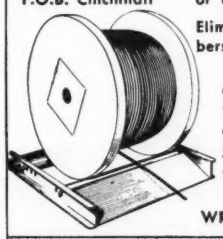

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Greenville, Ohio

Defines "Laytex" and describes its production and compounding to produce desirable insulating characteristics. The types of Laytex are listed. The method of applying the material to wire is described, following which, its properties and the kinds of cable for which it is peculiarly suited are discussed.

★ ★ ★

"Semi-Solid Coaxial Cables with Integral-Fin Insulation" by John F. S. Abbott, Development Dept., U. S. Rubber Company, Bristol, R. I.

This paper describes an improved, flexible, low-loss coaxial cable with an air-polyethylene dielectric developed by using special extrusion apparatus that produces the entire insulating structure in one continuous operation. The result has produced a semi-portable cable that will withstand frequent movement, vibration and exposure in audio-frequency communication uses. The construction of the cable, which includes a thin continuous cover over the center conductor, protects the wires against copper oxidation and insulation collapse during handling.

★ ★ ★

"Properties of Plasticizers and Their Relation to Electrical Compounding" by J. J. Morris, Product Manager, Fine Chemicals Dept., Carbide & Carbon Chemicals Co., and W. J. Canavan, Development Engineer, Bakelite Company, both companies being divisions of Union Carbide and Carbon Corporation, New York, N. Y.

Since most of the attention of technicians, during the past years when plasticized polyvinyl chloride compounds have been growing in use, has been given to the properties of the polyvinyl chloride resins, the authors felt that it would be well to stress the properties of plasticizers and their influence on compounding techniques and the quality of the insulating compounds.

★ ★ ★

Four main considerations are discussed: 1) plasticizer volatility and aging characteristics, 2) plastizer effects on resistivity, 3) plasticizer influence on dry blending rate and 4) effects of clay on plasticizer properties.

Two Norton Engineers Retire After Long Service

Norton Company of Worcester, Mass., announces the retirement of **William N. Jove,** Field Engineer in the Chicago area, after a career of over 51 years. **William D. Bennett,** Abrasive Engineer in Cleveland, retired after 46 years of service.

★ ★ ★

Mr. Jove started with Norton as an errand boy at the Chicago store at the age of 13. Soon after, he began selling wheels over the counter at the store. Later he became a member of the outside sales force as an abrasive engineer and field engineer in the Chicago area. At the 1952 Norton Service Award Dinner, he was admitted to membership in the 50-Year Club as its fifteenth member.

★ ★ ★

Mr. Bennett began his career as an office boy, later working in the Order, Sales Quotation, and Sales Engineering departments before being sent to Cleveland in 1930 as office manager. Since 1931 he has been an abrasive engineer in the Cleveland area.

★ ★ ★

Harlan W. Cobb has been named to succeed Mr. Bennett. Another long-timer with 37 years in Norton's employ, Mr. Cobb has been at Cleveland since 1929 holding positions as stock supervisor, junior abrasive engineer and office manager.

★ ★ ★

In another change, **Fred J. Benn** was appointed an Abrasive Engineer and will be responsible for a new territory created by dividing the territory formerly covered entirely by **Sherwood F. Prescott.** Mr. Benn will center his activities in Louisville, Kentucky, and cover a large portion of that state. Mr. Prescott will serve the Cincinnati area and cover southern Ohio, and eastern Indiana.

★ ★ ★

William Reibitz, formerly Field Engineer in Detroit has been appointed Abrasive Engineer in the Detroit area, exchanging jobs with **Allan Jaques.**

Extrusion Control

(*Continued from page* 402)

.005". A front panel control allows the tolerance of the controller to be set to any desired value. The controller in turn, by the aid of electronic circuits, transmits carefully timed impulses to the servomotor, and the system deals efficiently with the finest wires up to cables of 1" diameter.

Recent Advances

A feature of the aforementioned systems is the fact that once an error correction has been applied to the cable by the controller, no further action will be taken until a new length of cable has been extruded. This requirement is solved on a time basis by means of electronic delay circuits.

★ ★ ★

In a recently patented system, a more accurate method has been adopted, viz. one that is based on cable length. This method is of particular interest in cases where a range of large diameter cables are being extruded on one machine, and where the delays from die face to gage head may amount to minutes. The adjustable time delay unit which inhibits the controller action after each error correction has in this system been replaced by a pre-set length measuring device. The method involves in effect the counting of a pre-determined number of pulses. The latter are derived from the rotation of a roller in contact with the moving cable. This method has the added advantage that no more than a single step of error correction can be applied to the variable speed haul-off gear, when the cable stops, breaks, or is diverted out of the measuring system.

Average Diameter Controller

Another development in this field seems worth reporting. It is, of course, well known that cables, especially of heavier size, when extruded through a perfectly circular orifice, may develop a slightly oval crossection.

★ ★ ★

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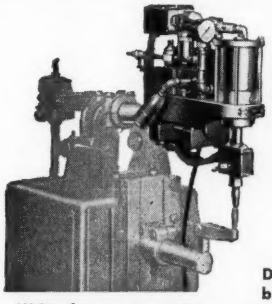

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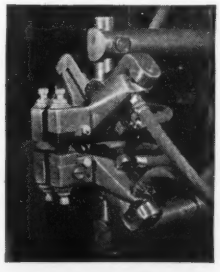

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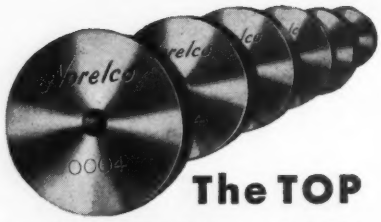

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Norelco

Note below the highly polished precision shaped drawing channel of this die for drawing copper which gives a burnished finish to the wire and long life to the die.

e.g. h.f. cables, a slight ovality is permissible; in fact the impedance of the cable will depend, within limits, on the mean of two orthogonal diameters, rather than on any one of these diameters. A similar requirement obtains in the case where e.g. a lead sheath with closely specified tolerances is to be applied to the outside of a rubber or P.V.C. insulated cable.

* * *

It was recognised, therefore, that in such instances the best results could be obtained only if the information fed to the controller corresponded to the average value of the diameter. Following a suggestion by Mr. P. Sharp of Telcon Ltd., suitable equipment was developed by the Addison Electric Co., Ltd., London. This equipment, for which patents have been applied, comprises two electro-magnetic gage heads mounted at right angles. The associated control cabinet shown in Fig. 4 comprises two indicating meters, one showing

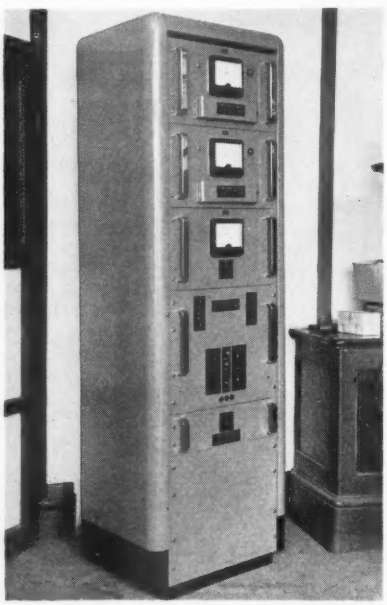

Figure 4—Average Diameter Indicator and Controller by courtesy of Telcon Ltd. * * * * *

the deviation of the horizontal diameter (Dh), the other that of the vertical diameter (Dv). The third panel contains a computor circuit with associated meter which latter indicates the deviation of the average diameter, (Dh +

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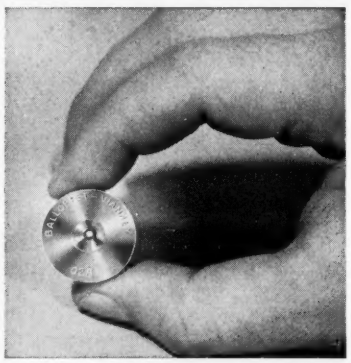

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Dv)/2. The three indicating meters possess identical calibrations of .005" — O — .005". A Tolerance control and conventional controller panel taking its input from the average diameter panel, and a servo-motor complete the equipment.

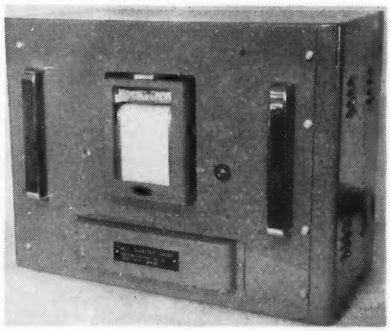

Figure 5—Recording Diameter Gage. * * * *

This Unit provides a continuous record of diameter variations on a linear chart.

Discussion on Precision Spring Design

(*Continued from page 397*)

Fangemann, M. G.—Temperature Compensated Springs for Aircraft Application; Aeronautical Engineering Review, Aug., '52.

Fangemann, M. G.—Springs—Their Properties and Applications; Plant Engineering, Sept., '52.

Haringx, J. A.—Instability of Springs; Product Engineering, July, '51: pp. 227-228.

Haringx, J. A.—Instability of Springs; Philips Tech. Review, VII, #8, Feb., '50: pp. 245-251.

Haringx, J. A.—Elastic Stability of Spiral Springs; Applied Science Research, Vol. A2, #1, 1949: pp. 9-30.

Roberts, J. A.—Spring Design and Calculations; Redditch, England, 1947.

Wahl, A. M.—Mechanical Springs; Penton Pub. Co., Cleveland, Ohio.

New Booklet Presents Modernized Line of Multiple Plunger Pillar Presses

A new, 8-page, 8½" x 11" folder published by Waterbury Farrel Foundry and Machine Co., of Waterbury, Conn., gives extensive details on the company's modernized line of multiple plunger pillar presses. Complete specifications

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Continuous Drawing Machines For Heavy, Intermediate and Fine Sizes
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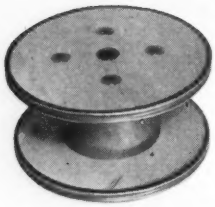

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and capacities are given in tabular form for six sizes of presses.

★ ★ ★

The bulletin illustrates several sizes of the machines and pictures examples of the type of work produced on them. Close-up views show details of important portions such as the tooling arrangement.

★ ★ ★

Included are descriptions of the modern design features which give these presses greater efficiency, easier operator control, economy of operation and increased flexibility. Among the features covered are automatic work control, accessible tooling and independent tool adjustment, roll feeds, finger motion with safety device, air clutch, etc.

★ ★ ★

Information is also given on accessory equipment such as straightener and feeder, scrap winder and scrap cutter. A standard Waterbury Farrel scrap winder is illustrated.

★ ★ ★

The final page of the bulletin includes a list of some of the wide variety of presses and other mass production metalworking equipment produced by the company.

★ ★ ★

Copies of this bulletin are available on request from Waterbury Farrel Foundry & Machine Company, Waterbury 20, Conn.

Folder Gives Information on Polyethylene

Information about molding extruding and other ways to use Bakelite polyethylene as well as properties of resins is presented in a new, 8-page folder published by **Bakelite Company,** a Division of **Union Carbide and Carbon Corporation.**

★ ★ ★

Entitled "Bakelite Polyethylene," the folder also contains photographs showing principal applications of the material for packaging, wire covering, housewares, pipe and industrial products.

★ ★ ★

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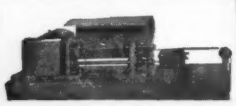
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Three tables list properties of various Bakelite polyethylene resins available in commercial and experimental quantities and also of compounds that are blended with suitable colorants and antioxidants and made available as molding, extrusion and electrical compounds.

★ ★ ★

Copies of this folder (GA) may be obtained from Bakelite Company, 300 Madison Avenue, New York 17, N. Y.

Correction

Through an unfortunate circumstance, the color plate in the advertisement of the **Harper Electric Furnace Company** that appeared on page 297 in our March issue was omitted, so that the caption "Continuous Bright Annealing of Stainless Steel Wire" and the descriptions of the illustrations were not printed. The corrected advertisement appears this month on page 419.

★ ★ ★

The Harper electric strand annealing furnace for stainless steel wire is designed for bright annealing in a hydrogen atmosphere at accurately controlled temperatures within a range of 2000°-2200° F. High uniformity in annealing is secured with this type of furnace, which is made in various sizes to accommodate up to 30 strands of wire. A furnace embodying similar principles is made for annealing strip. The company also makes a complete line of industrial furnaces of all types for heat treating.

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WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.
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ABRASIVES—
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Norton Co., Worcester, Mass.

ACID INHIBITORS—
(See Inhibitors, Pickling)

ACID-PROOF CONSTRUCTION—
Ceilcote Company, Cleveland, Ohio
Chemical Construction Co., Pittsburgh, Pa.
Haveg Corporation, Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio

ALLOYS—Hardsurfacing Capstans, etc.
Parkway-Kew Corp., Menlo Park, N. J.

ANNEALING MACHINES — Electric Resistance
Syncro Machine Co., Perth Amboy, N. J.
Trauwood Engr. Co., Cleveland, O.

ANNEALING POTS AND BOXES—
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

BAKERS—
(See OVENS—Rod Bakers)

BOBBINS—Braider & Wire Weaving
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

BORAX—Wire Drawing
Pacific Coast Borax Co., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

BRAKES—Pneumatic
Entwistle, Jas. L. Co., Providence, R. I.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

CEMENTS—Acid Proof
Ceilcote Company, Cleveland, Ohio

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Metal & Thermit Corp., New York, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Chicago.

CLEANING & PICKLING EQUIP.—
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, O.
Haveg Corporation, Newark, Del.
Holden, A. F., Company, The, Detroit, Mich.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio
Youngstown Welding & Eng'g Co., Youngstown, Ohio.

CLOTH—WIRE, All Metals
Chase Brass & Copper Co., Waterbury, Conn.
Gantois, Saint Die (Vosges), France.
Wickwire Bros., Cortland, N. Y.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago

COMPOUNDS—Coppering
American Chemical Paint Co., Ambler, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.

COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago.
Superior Abrasive Labs., Yonkers, N. Y.

COMPOUNDS—Extrusion, for Wire
(See COMPOUNDS—Vinyl)

COMPOUNDS—For Improving Drawing and Extrusion
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Metal Finishing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Metal & Thermit Corp., New York, N. Y.

COMPOUNDS—Phosphate Coating
American Chemical Paint Co., Ambler, Pa.

COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
American Lanolin Corporation, Lawrence, Mass.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago.

COMPOUNDS—Vinyl, for Wire
Electronic Rubber Co., Stamford, Conn.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Cook's Sons, Inc., Adam, Linden, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Pacific Coast Borax Co., New York, N. Y.
Standard Industrial Compounds Co., Chicago.
Swift & Company, Chicago, Ill.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTING TOOLS—Carbide
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Utica Drop Forge & Tool Corp., Utica, N. Y.
Vascoloy-Ramet Corp., Waukegan, Ill.
Willey's Carbide Tool Co., Detroit, Mich.

CUTTING TOOLS—Wire
Porter, H. K. Inc., Somerville, Mass.

DESCALING PROCESS—Sodium Hydride
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDERS—
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Industrial Diamond Powders, New Kensington, Pa.
National Research Company, St. Clair Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIAMOND POWDER RECLAIMING—
Danforth, The C. W. Co., Youngstown, Ohio
Industrial Diamond Powders, Inc., New Kensington, Pa.
National Research Co., St. Clair Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Nord International Corp., Orange, N. J.
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Vascoloy-Ramet Corp., Waukegan, Ill.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Cold Heading
Carboloy Dept. of General Electric Co., Detroit
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Vascoloy-Ramet Corp., Waukegan, Ill.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Cochaud Wire Die Inc., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., Elmet Div., Lewiston, Me.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Wayne Wire Die Co., Hillside, N. J.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelly Wire Die Corp., New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc, New York, N. Y.
Carboloy Dept. of General Electric Co., Detroit.
Cochaud Wire Die Inc., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Ft. Wayne Wire Die., Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., Elmet Div., Lewiston, Me.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Cranford, N. J.
Vascoloy-Ramet Corp., Waukegan, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tube Drawing
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Dept. of General Electric Co., Detroit.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Vascoloy-Ramet Corp., Waukegan, Ill.
Willey's Carbide Tool Co., Detroit, Mich.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS & TRAVERSES—For Cable Reels
Entwistle, Jas. L. Co., Providence, R. I.
Hubbard Spool Co., Garrett, Ind.
New York Engineering Co., Yonkers, N. Y.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

DRYING EQUIPMENT
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S. Co., Fairfield, Conn.

ENGINEERS—Consulting
Lubricants—Hans C. Bick, Inc., Reading, Pa.
Wire Mill—Clarence S. Arms, Worcester, Mass.
Zinc—Imhoff, Wallace G., Co., No. Highlands, Calif.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio
Harper Electric Furnace Corp., Buffalo, N. Y.
Lepel High Frequency Laboratories, Inc., New York, N. Y.
Rockwell, W. S. Co., Fairfield, Conn.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F. Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engineering Co., The, Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Lepel High Frequency Laboratories, Inc., New York, N. Y.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Morrison, John R., Industries, Inc., Cleveland, Ohio
Rockwell, W. S., Co., Fairfield, Conn.
Spring Mfgrs. Supply Co., Plantsville, Conn.
Surface Combustion Corp., Toledo, Ohio
Trauwood Engr. Co., Cleveland, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Induction
Lepel High Frequency Laboratories, Inc., New York, N. Y.

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, Detroit, Mich.

FURNACES—Resistance Heating, Strand
(See Annealing Machines)

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Holden, A. F., Co., The, Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio

GALVANIZING EQUIPMENT — (See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worchester, Mass.

GUIDES—For Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HARDSURFACING ALLOYS—
(See Alloys—Hardsurfacing)

HOOKS—Pickling & Liming
Youngstown Welding & Eng'g' Co., Youngstown, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INSULATING MATERIALS—
Celanese Corporation of America, New York, N. Y.
Electronic Rubber Co., Stamford, Conn.
Glass Fibers, Inc., Toledo, Ohio
Heineman Corp., Oscar, Chicago, Ill.
Libbey-Owens, Ford Glass Co., Fiber Glass Div., Toledo, Ohio
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.

INSULATING MATERIALS — Paper—For Electric Wire Cable
Merrimac Paper Co., New York, N. Y.

LACQUERING SYSTEMS — See MACH.—Lacquering Electric Wire

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The, Philadelphia and Bellefonte, Pa.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany
Wean Engineering Co., Cleveland, Ohio

MACHINERY—Braiding
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Wardwell Braiding Mach. Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Inc., Philadelphia, Pa.
Haskell-Dawes Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
New York Engineering Co., Yonkers, N. Y.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Machinery—Winding Wire)

MACHINERY—Centerless Grinding
Schumag Schumacher Metallwerke, Aachen, Germany.

MACHINERY—Chain Making
Cosa Corporation, New York, N. Y.
Nilson, A. H. Machine Co., Bridgeport, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Closing Rope
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Coiling Rod
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Cold Heading
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Copper Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh.
American Insulating Mach'y Co., Phila., Pa.
National Mach'y Exch. (Used), New York.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Utica Drop Forge & Tool Corp., Utica, N. Y.
Wean Equipment Corp., Cleveland, Ohio
Wells, Frank L., Co., Kenosha, Wis.

MACHINERY—Descaling Rod, Dry
Fisher Associates, New York, N. Y.
Herborn, Herborn, Germany.

MACHINERY—Diameter Testing Continuous
Standard Electronic Research Corp., New York, N. Y.

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Carboloy Dept. General Electric Co., Detroit, Mich.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelly Wire Die Corp., New York, N. Y.
Nord International Corp., Orange, N. J.
Wayne Wire Die Co., Hillside, N. J.

MACHINERY—Draw Benches
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Dry Blending, Plastics
Robinson Manufacturing Co., New York, N. Y.

MACHINERY—Electrode Grinding
Cosa Corporation, New York, N. Y.

MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, Ohio
Rockwell Co., W. S., Fairfield, Conn.

MACHINERY—Extruding
Aetna-Standard Engineering Co., Pittsburgh.
Davis-Standard Sales Corp., Mystic, Conn.
Entwistle Co., J. L., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co., Morton, Ill.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Forming Wire
Baird Machine Co., Stratford, Conn.
Nilson, A. H., Machine Co., Bridgeport, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating Wire
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis-Standard Sales Corp., Mystic, Conn.
Ets. Pourtier Frères, Romainville, France
Fidelity Machine Co., Inc., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Mach. Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Inc., Philadelphia, Pa.

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia.
Cook Mfg. Co., The, Paterson, N. J.
Industrial Ovens, Inc., Cleveland, O.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Interlocking Fence Co., Morton, Ill.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Providence, R. I.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Baird Machine Co., The Stratford, Conn.
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Youngstown Welding & Eng'g Co., Youngstown, Ohio.

MACHINERY—Pin Making
Baird Machine Co., The, Stratford, Conn.
Cosa Corporation, New York, N. Y.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury Conn.
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Poultry Wire Fencing
Interlocking Fence Co., Morton, Ill.
Wean Equipment Corp., Cleveland, O.

MACHINERY—Re-Spooling
Boyd & Sons Manufacturing Corp., Philadelphia, Pa.
Davis Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Providence, R. I.
National Mach'y Exch. (Used), New York, N. Y.
Steel Equipment Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

MACHINERY—Rod Mill
Morgan Construction Co., Worcester, Mass.
Schumag Schumacher Metallwerke, Aachen, Germany
Wean Equipment Corp., Cleveland, Ohio

MACHINERY—Rolling Mill
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Sales Corp., Mystic, Conn.
Royle, John & Sons, Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spark Testing
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Federal Manufacturing Co., Wallingford, Conn.
Peschel Electronics, Inc., New Rochelle, N. Y.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Spring Making
Carlson Company, The, New York, N. Y.
Lundahl Corp., Winsted, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt., Germany
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.
Wafios, Maschinenfabrik, Reutlingen 3, Wurtt, Germany.

MACHINERY—Straightening & Cutting
Cosa Corporation, New York, N. Y.
Kilmer, M. D., & Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Medart Co., The, St. Louis, Mo.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Haskell-Dawes Machine Co., Philadelphia, Pa.
Hughesville Machine & Tool Co., Hughesville, Pa.
Maillefer S. A., Renens-Lausanne, Switzerland.
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Robinson Manufacturing Co., New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Studmaking
Cosa Corporation, New York, N. Y.

MACHINERY—Swaging
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Take-Up and Pay-Out
Aetna-Standard Engineering Co., Pittsburgh, Pa.
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Sales Corp., Mystic, Conn.
Ets. Pourtier Frères, Romainville, France
Federal Manufacturing Co., Wallingford, Conn.
Industrial Ovens, Inc., Cleveland, Ohio
New York Engineering Co., Yonkers, N. Y.
Robinson Manufacturing Co., New York, N. Y.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Ets. Pourtier Frères, Romainville, France
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Testing Magnet Wire Coatings for Pin Holes
Peschel Electronics, Inc., New Rochelle, N. Y.

MACHINERY—Testing, Physical
Lundahl Corp., Winsted, Conn.
Scott Testers, Inc., Providence, R. I.
Spring Mfgs. Supply Co., Plantsville, Conn.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill, Cold Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Federal Manufacturing Co., Wallingford, Conn.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot)

MACHINERY—Washer Forming
Cosa Corporation, New York, N. Y.

MACHINERY—Winding Wire
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Newark, N. J.
Entwistle Jas. L., Co., Providence, R. I.
Federal Manufacturing Co., Wallingford, Conn.
New England Butt Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Pittsburgh, Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Herborn, Herborn, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Schumag Schumacher Metallwerke, Aachen, Germany
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Forming
Baird Machine Co., The, Stratford, Conn.
Cosa Corporation, New York, N. Y.
Kilmer, M. D., & Co., Cleveland, Ohio
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Wire Rope
Milton Machine Works, Inc., Milton, Pa.
New England Butt Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Wean Equipment Co., Cleveland, Ohio

NAIL TOOLING—Tungsten Carbide
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Brothers, Inc., Cortland, N. Y.

NOZZLES—For Extruding Machines
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison, John R., Industries, Inc., Cleveland, Ohio
Rockwell Co., W. S., Fairfield, Conn.

OVENS—Rod Bakers
Carl-Mayer Corp., The, Cleveland, Ohio
Morrison, John R., Industries, Inc., Cleveland, Ohio

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Ovens, Inc., Cleveland, Ohio
Morrison, John R., Industries, Inc., Cleveland, Ohio

PAINT—Acid Proof
Ceilcote Company, Cleveland, Ohio

PAINT BONDING CHEMICALS—
American Chemical Paint Co., Ambler, Pa.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAPER—Creped Wrapping
National Waterproof Papers, Inc., Camden, N. J.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
National Waterproof Papers, Inc., Camden, N. J.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D. C.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PICKLING—Hooks, etc. Acid Resisting
Youngstown Welding & Eng'g Co., Youngstown, Ohio

PICKLING TANK LININGS—
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio

PIPES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

PLASTICS—for Wire Insulation
Electronic Rubber Co., Stamford, Conn.

PLIERS—For Wire
Utica Drop Forge & Tool Corp., Utica, N. Y.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio

PRESSES—Hydraulic and Mechanical
Aetna-Standard Engineering Co., Pittsburgh, Pa.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Wean Equipment Corp., Cleveland, Ohio

REEL AND TENSION STANDS—
Davis Electric Co., Wallingford, Conn.
Entwistle, Jas. L. Co., Providence, R. I.
Fidelity Machine Company, Inc., Philadelphia
Industrial Ovens, Inc., Cleveland, Ohio.
Kilmer, M. D., & Co., Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio
New York Engineering Co., Yonkers, N. Y.
Roll-A-Reel, Cincinnati, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

REEL CRUTCHES—
Roll-A-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Co., Garrett, Ind.
Milton Machine Works, Inc., Milton, Pa.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Co., Garrett, Ind.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., Wm., Westport, Mass.

REELS—Plywood
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Co., Garrett, Ind.
McCaskie, Inc., Wm., Westport, Mass.
Nelson Company, The, Baltimore, Md.
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L. Mfg. Co., Rockford, Ill.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Co., Garrett, Ind.
Mason Can Company, East Providence, R. I.
Milton Machine Works, Inc., Milton, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New York Engineering Co., Yonkers, N. Y.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.

WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Minn.
Howsam Spool Co., Aurora, Ill.
Hubbard Spool Co., Garrett, Ind.
Mason Can Company, East Providence, R. I.
McCaskie, Inc., Wm., Westport, Mass.
Mettler Machine Tool, Inc., New Haven, Conn.
Milton Machine Works, Inc., Milton, Pa.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
New York Engineering Co., Yonkers, N. Y.
Republic Steel Corp., Pressed Steel Div., Niles, Ohio
Winchester Reel Co., Ashuelot, N. H.

REELS & SPOOLS—Wooden
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co., Pine River, Minn.
Hubbard Spool Co., Garrett, Ind.
Nelson Company, The, Baltimore, Md.
Winchester Reel Co., Ashuelot, N. H.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Crucible Steel Co. of America, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.

RODS—Steel
Crucible Steel Co. of America, Pittsburgh, Pa.

RODS—Wire—Non-Ferrous
Chase Brass & Copper Co., Waterbury, Conn.
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Sheffield Steel Corp., Kansas City, Mo.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Blocks
Madesco Tackle Block Co., Easton, Pa.

ROPE—Wire
American Steel & Wire Company, Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Co., The, Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio
New York Engineering Co., Yonkers, N. Y.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SODIUM—for Descaling
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Holden, A. F., Co., The, Detroit, Mich.

SPOOLS—(See Reels & Spools)

SPOOLS—Stamped Metal for Retail Wire Sales
Clark, J. L. Mfg. Co., Rockford, Ill.
Mason Can Co., East Providence, R. I.

STAMPINGS—Steel
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

STRIPPERS—Wire, Electric
Utica Drop Forge & Tool Corp., Utica, N. Y.

TANKS—Compound
New York Engineering Co., Yonkers, N. Y.
Watson Machine Co., Paterson, N. J.

TANKS—Pickling and Plating
Ceilcote Company, Cleveland, Ohio
Chemsteel Construction Co., Pittsburgh, Pa.

TESTERS — INSULATION
(See MACHINERY—Spark Testers)

TESTING EQUIPMENT
(See MACHINERY Testing, Physical and Diameter Testing)

TESTING EQUIPMENT—Springs
Spring Mfgs. Supply Co., Plantsville, Conn.

TINNING PROCESS—
Metal & Thermit Corp., New York, N. Y.

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper, Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TOOLS—Spring Forming
Lundahl Corp., Winsted, Conn.
Spring Mfgs. Supply Co., Plantsville, Conn.

TOOLS—Welding Wire, Strip & Foil (Pressure)
Utica Drop Forge & Tool Corp., Utica, N. Y.

TOOLS—Wire Cutting
Porter, H. K. Inc., Somerville, Mass.
Utica Drop Forge & Tool Corp., Utica, N. Y.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRANSMISSIONS—Variable speed (See Machy—Power Transmission)

TRAVERSES & DRUMS—For Reels
Drums & Traverses (See Drums & Traverses)

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

TUBE BENDERS AND FORMERS—
Kilmer, M. D., & Co., Cleveland, Ohio

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—for Electric Wire
N. E. Lacquer Co., E. Providence, R. I.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Wire Insulating Machy., Div. of Machinery Electrification, Inc., Northboro, Mass.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Hoffman Co., Robt. W., Chicago, Ill.
Micro Products Co., Chicago, Ill.
Utica Drop Forge & Tool Corp., Utica, N. Y.

WIRE—Aluminum
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Malin & Co., The, Cleveland, Ohio
Scovill Mfg. Co., Waterbury, Conn.
Seneca Wire & Manufacturing Co., Fostoria, O.

WIRE—Barbed
Interlocking Fence Co., Morton, Ill.

WIRE—Brass
Chase Brass & Copper Co., Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Spencer Wire Corp., Union, N. J.

WIRE—Brush
Spencer Wire Corp., Union, N. J.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind
Crucible Steel Co. of America, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Conn.
Seneca Wire & Manufacturing Co., Fostoria, O.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Copper
Chase Brass & Copper Co., Waterbury, Conn.
Spencer Wire Corp., Union, N. J.

WIRE—Flat, Fine
Elmet Division, North American Philips Company, Inc., Lewiston, Maine
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Galvanized
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Sheffield Steel Corp., Kansas City, Mo.
Wickwire Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Continental Steel Corp., Kokomo, Ind.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Worcester, Mass.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark, N. J.
North American Philips Co., Inc., Elmet Division, Lewiston, Me.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Seneca Wire & Manufacturing Co., Fostoria, O.
Sheffield Steel Corp., Kansas City, Mo.
Spencer Wire Corp., Union, N. J.
U. S. Steel Co., N. Y., N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Music
American Steel & Wire Co., Cleveland, Ohio
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
Seneca Wire & Manufacturing Co., Fostoria, O.
Spencer Wire Corp., Union, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Chase Brass & Copper Co., Waterbury, Conn.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Malin & Co., The, Cleveland, Ohio

WIRE—Oil Tempered
Crucible Steel Co. of America, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffie'd Steel Corp., Kansas City, Mo.

WIRE—Special Shapes
Charter Wire, Inc., Milwaukee, Wisc.
Crucible Steel Co. of America, Pittsburgh, Pa.
Continental Steel Corp., Kokomo, Ind.
National Lock Washer Company, The, Newark, N. J.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Sheffie'd Steel Corp., Kansas City, Mo.
Wickwire Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio
Crucible Steel Co. of America, Pittsburgh, Pa.
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Steel—Also Coppered and Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Sheffield Steel Corp., Kansas City, Mo.
Spencer Wire Corp., Union, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., Elmet Division, Lewiston, Me.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

YARNS & TAPES—Insulating
Celanese Corporation of America, New York, N. Y.
Glass Fibers, Inc., Toledo, Ohio
Heineman Corp., Oscar, Chicago, Ill.
Libbey-Owens-Ford Glass Co., Fiber Glass Div., Toledo, Ohio.

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

WATSON

ELECTRIC PATCH VULCANIZERS

THESE UNITS PROVIDE FOR A QUICK AND EFFECTIVE METHOD OF REPAIRING FAULTY SECTIONS OF INSULATION ON MANY TYPES OF ELECTRICAL WIRE AND CABLES. ALL MODELS ARE WIRED FOR 115 OR 230 VOLTS AND ARE EQUIPPED WITH A 250° TO 480°F. CALIBRATED THERMOSTATIC CONTROL.

FLAT PLATE TYPE

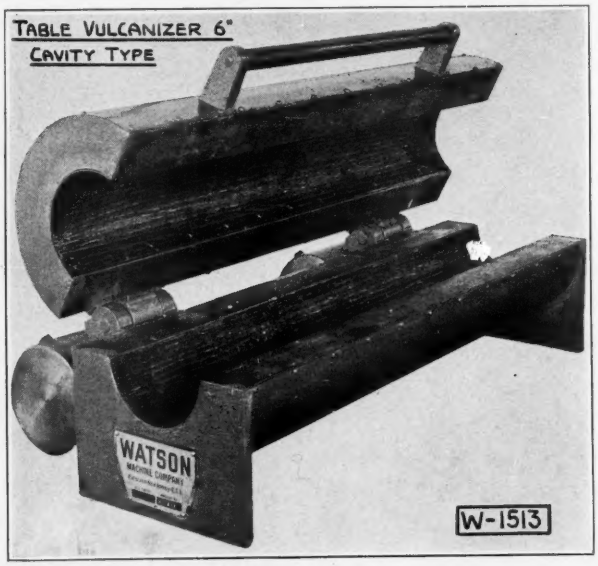
VULCANIZATION ACCOMPLISHED BY DIRECT CONTACT OF THE INSULATION TO THE HEATED DIE. THIS MODEL MAY BE FURNISHED WITH A FOOT VALVE CONTROLLED, *AIR-OPERATED JAW*, AS SHOWN BY CUTS W-1763A&B, OR WITH A *HANDWHEEL ACTUATED SCREW OPENING JAW*. DIE SETS OPTIONAL WITH OR WITHOUT GROOVES.

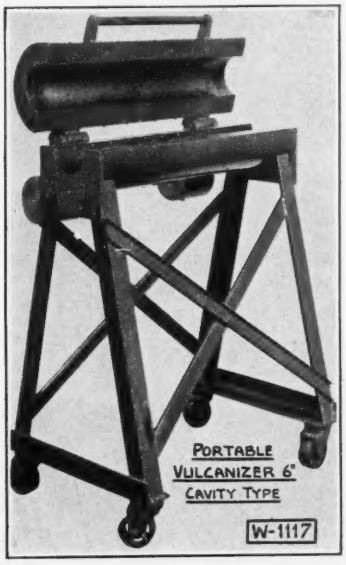
CAVITY TYPE

THIS TYPE IS USED FOR CABLES EXCEEDING IN SIZE THOSE HANDLED IN THE FLAT PLATE TYPE AND IN WHICH THE INSULATION IS VULCANIZED BY PLACING THE CABLE IN THE PRESENCE OF HEATED AIR. OFFERED IN THE *TABLE MODEL*, AS PER CUT W-1513, OR MOUNTED ON A *PORTABLE CARRIAGE*, SHOWN BY CUT W-1117.

FLAT PLATE TYPE			
Size in Watts	Die-set Dimensions W x T x Lght.		
1000	4¾"	1 15/16"	7"
2000	5"	2 15/16"	10"
2800	5⅞"	3 15/16"	14"

CAVITY TYPE		
Size in Watts	Cavity Diam. x Length	
2000	4"	24"
4500	6"	32"
9000	10"	36"





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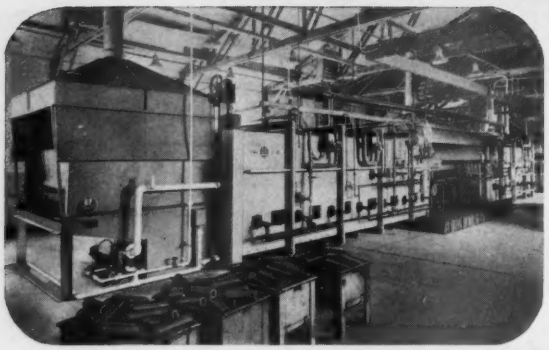

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A recent installation of five EF special atmosphere continuous furnaces bright annealing stainless steel wire.

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to Pioneer and Perfect the Use of Endothermic, Exothermic and Other Special Atmosphere Treatments

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FIRST!
to Develop Continuous Furnaces Using Low Cost Atmospheres for Bright Annealing Ferrous and Non-Ferrous Tubing, Strip, Wire, etc.

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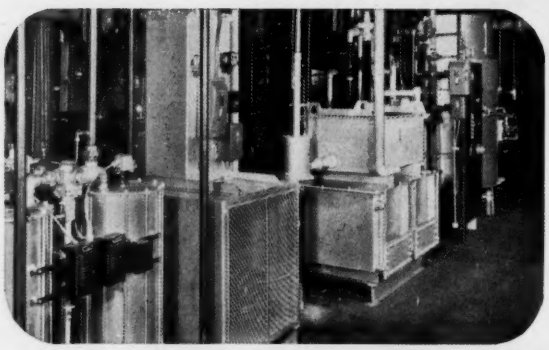

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